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ADDENDUM TO RISK EVALUATION FOR POST-REMOVAL CONDITIONS SITE 3 NSWC WHITE OAK MD

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ADDENDUM - RISK EVALUATION
FOR
POST-REMOVAL CONDITIONS
SITE 3 - PISTOL RANGE LANDFILL

FORMER
NAVAL SURFACE WARFARE CENTER
WHITE OAK
SILVER SPRING, MARYLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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This report presents the results of the human health risk assessment (HHRA) for post-removal soil at Site 3, Pistol Range Landfill, located in NSWC, White Oak. The risk assessment is an addendum to the risk assessment for Site 3 presented in the RCRA Facility Investigation (RFI) for Sites 2,3,4,7,8,9 and Paint Branch (TtNUS, Inc, October 2000) and follows the methodologies presented in Section 2 of the RFI. In this addendum, post-removal soil and sediment analytical data for Site 3 collected in August and November, 2000 and April 2002 are evaluated for the same exposure pathways and receptors as the RFI. The post-removal data used in this evaluation completely replaces the soil and sediment data used in the RFI and represent soil and sediment left in place after an interim removal action had occurred at the site. The report also presents an ecological evaluation of the sediments.

1.0 HUMAN HEALTH RISK ASSESSMENT

The HHRA for Site 3 consists of the five components used in the risk assessment process. These include: (1) Data Evaluation; (2) Exposure Assessment; (3) Toxicity Assessment; (4) Risk Characterization, and (5) Uncertainty Analysis. Sections 2.8.1 through 2.8.5 of the RFI contain detailed discussions of the general methodologies followed for each component of the HHRA and Section 8.5 of the RFI discusses these components as they apply to Site 3. The following sections discuss these components as they apply to this addendum.

1.1 Data Evaluation

The data evaluation section is primarily concerned with the selection of potential contaminants of concern (PCOCs) that are representative of the type and magnitude of potential human health effects. The PCOC screening process involves the comparison of maximum site concentrations to risk-based screening levels and other health-based standards. A brief discussion of data usability is also provided in the following section.

This section addresses the usability of the post-excavation soil data and soil data from the 1999 RFI for risk assessment purposes. Validated post-excavation confirmation soil data collected in August 2000 and sediment data collected in November 2000 and April 2002 by Tetra Tech NUS, Inc. were used to evaluate risks for Site 3. The list of samples used in this evaluation are presented in Tables 1 and 2 and the validated analytical data are provided in Appendix A.

All analytical data used in the quantitative estimation of potential risks were subjected to data validation. Only data of adequate quality, current and historical, were used in the risk evaluation. A discussion of data validation protocol followed for data generated for the NSWC-White Oak is provided in the Master Quality Assurance Project Plan QAPP (B&R Environmental, 1998). Analytical data qualified as estimated and data qualified for blank contamination (considered as non-detects) were used in the risk assessment. When determining exposure concentrations via statistical procedures, chemicals were conservatively assumed to be present at a concentration equal to one-half the sample-specific quantitation limit.

1.1.1 Selection of Potential Chemicals of Concern (PCOCS)

The selection of PCOCs is a qualitative screening process with the purpose of limiting the number of chemicals to those site-related constituents that dominate overall potential risks. In this evaluation, a chemical is selected as a PCOC if the maximum detected concentration exceeds the PCOC screening level, and, for inorganics, if the chemical is determined to be present at concentrations above background. The PCOC screening levels are based on USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, April 2002) for residential and industrial land use and correspond to a systemic hazard quotient of 0.1 for noncarcinogenic health effects or a lifetime cancer risk of 1E-6 for carcinogenic effects.

Frequency of detection is used to exclude chemicals when data sets of 20 samples or greater are available. Generally, a detection rate of 5 percent or less justifies elimination of the chemical from further consideration provided that the concentrations detected are not representative of a "hot spot" area. Chemicals eliminated from further evaluation at this step are assumed to present minimal risks to potential human receptors.

The essential nutrients calcium, magnesium, potassium, and sodium are not identified as PCOCs. These inorganic chemicals are naturally abundant in environmental matrices and are only toxic at high doses. In addition, because of the lack of toxicity criteria, risk-based PCOC screening levels are not available for some chemicals. For these constituents [benzo(g,h,i)perylene and phenanthrene] surrogate chemicals (which have toxicity criteria) are used for screening purposes. For example, the RBC for naphthalene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.

Inorganic constituents found at concentrations indicative of background levels are not considered to be site-related contaminants and are not retained as PCOCs. Site-specific background data are used to determine whether detected chemicals are present at naturally occurring levels. The base-wide background concentrations for soil (Tetra Tech NUS, Inc., December 1998) were compared to concentrations of inorganics by the Wilcoxon Rank Sum Test at the 80 percent confidence level. If the Wilcoxon test determined that the concentration of a constituent was significantly greater than background and the concentration was greater than its residential RBC, that metal was retained as a

PCOC. All metals detected in soil samples were found to be within naturally occurring soil levels at the site. The results of the Wilcoxon test are presented in Appendix A.

Chemicals eliminated from further evaluation at this step are assumed to present minimal risks to potential human receptors.

1.1.1.1 Identification of PCOCs in Surface/Subsurface Soil

The list of PCOCs developed for soil at Site 3 is based on soil data set that consists of 10 soil samples collected in August 2000. A summary of the PCOC selection process for exposure to soil under residential land use is presented in Table 1. PCOCs for soil are those chemicals reported at maximum concentrations greater than screening levels based on USEPA Region III RBCs for residential soil ingestion and basewide background levels.

The following chemicals were retained as PCOCs for soil:

- PAHs - benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene
- PCBs - Aroclor-1260
- Metals – antimony, copper, mercury, silver

Maximum constituent concentrations were also compared to USEPA Generic Soil Screening Levels (SSLs) for inhalation (transfers from soil to air) and SSLs for migration to groundwater but these comparisons were not used to select PCOCs (Table 1). The maximum concentrations of all constituents detected in post-removal soils at Site 3 were less than the inhalation SSLs. Therefore, exposure to fugitive dust and volatile organic compounds potentially released from soil are considered to be relatively insignificant at the Site, based on this qualitative evaluation, and are not considered further in this risk assessment. The results of the migration to groundwater comparisons are discussed in the Uncertainty Analysis, Section 5.0.

1.1.1.2 Identification of PCOCs in Sediment

The list of PCOCs developed for sediment at Site 3 is based on the post-removal data set that consists of 6 sediment samples collected in November 2000 and April 2002. Note that the samples collected in April 2002 were analyzed only for PCBs, mercury, and silver. A summary of the PCOC selection process for exposure to sediment under residential land use is presented in Table 2. PCOCs for sediment are those chemicals reported at maximum concentrations greater than screening levels based on USEPA Region III RBCs for residential soil ingestion and basewide sediment background levels.

The following chemicals were retained as PCOCs for sediment:

- PAHs - benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene
- PCBs – Aroclor-1254, Aroclor-1260
- Pesticides – 4,4'-DDT
- Metals – aluminum, antimony, arsenic, cadmium, chromium, copper, iron, manganese, mercury, vanadium

1.2 Exposure Assessment

A human health exposure assessment defines and evaluates, quantitatively or qualitatively, the type or magnitude of human exposure to PCOCs identified in environmental media at a site under investigation. The exposure assessment for this addendum employs the methodologies described in Sections 2.8.2 and 8.5.2 of the RFI. As identified in Section 2.8.2, the potential human receptors evaluated at Site 3 include: full time workers, maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, day care center children, and child and adult residents. Pathway-specific information for these receptors, such as the values of exposure parameters used to quantify exposure, are presented in Tables 4.1 through 4.8 provided in Appendix B. The values of the exposure parameters presented in these tables are identical to the values employed in the RFI with the exception of some factors associated with dermal exposure (i.e., soil-to-skin adherence factors, dermal absorption factors, and skin surface areas). The values of these factors have been updated to reflect recent USEPA guidance provided in Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance, Dermal Risk Assessment) (USEPA, September 2001).

Exposure Point Concentrations

The exposure point concentration (EPC), which is calculated for PCOCs only, is a reasonable maximum estimate of the chemical concentration that is likely to be contacted over time and is used to calculate estimated exposure intakes. The 95 percent upper confidence limit (UCL), which is based on the distribution of a data set, is considered to be the best estimate of the exposure concentration for data sets with 10 or more samples. The methodology for calculating the 95% UCLs is presented in Section 2.8.2.3 of the RFI. The 95 percent UCL is used as the exposure point concentration for surface/subsurface soil for this addendum. Note that the UCLs calculated for some PCOCS exceeded the maximum detected concentrations. Therefore, the maximum concentrations were used as the EPCs for these PCOCs in the risk calculations. Because the dataset for some PCOCs in sediment consists of less than 10 samples, the maximum concentration is used as the EPC for these PCOCs. The EPCs for the chemicals identified as PCOCs in soil and sediment are presented in Tables 3.1 and 3.2, respectively in Appendix B.

1.3 Toxicity Assessment

The toxicity assessment for NSWC, White Oak is presented in Section 2.8.3 of the RFI.

1.4 Risk Characterization

This section provides the methodologies and results for the characterization of the potential human health risks associated with the potential exposure to post-removal soil at Site 3.

Quantitative estimates of risk are calculated using intake and toxicity values according to risk assessment methods outlined in current USEPA guidance (USEPA, 1989). Lifetime cancer risks are expressed in the form of dimensionless probabilities, referred to as Incremental Lifetime Cancer Risks (ILCRs) which are derived using published cancer slope factors (CSFs). Noncarcinogenic risk estimates are presented in the form of Hazard Quotients (HQs) that are derived using published reference doses (RfDs).

ILCR estimates are generated for each PCOC using estimated exposure intakes and published CSFs, as follows:

$$\text{ILCR} = (\text{Estimated Exposure Intake})(\text{CSF})$$

The ILCRs for all PCOCs in an exposure scenario are summed to give a cumulative ILCR. An ILCR of $1x10^{-6}$ indicates that the exposed receptor has a one-in-one-million chance of developing cancer under the defined exposure scenario. Alternatively, such a risk may be interpreted as representing one additional case of cancer in an exposed population of one million persons.

Noncarcinogenic risks are assessed using the concept of HQs and Hazard Indices (HIs). The HQ for a PCOC is the ratio of the estimated intake to the RfD, as follows:

$$\text{HQ} = (\text{Estimated Exposure Intake}) / (\text{RfD})$$

An HI is generated by summing the individual HQs for all of the PCOCs. It should be noted that HI is not a mathematical prediction of the severity of toxic effects and therefore is not a true "risk"; it is simply a numerical indicator of the possibility of the occurrence of noncarcinogenic (threshold) effects.

The calculations of the ILCRs and HQs for all receptors and exposure routes are provided in the RAGS Part D tables presented in Appendix B (Tables 7.1 through 7.8 present risk assessment calculations of

the HQs and Tables 8.1 through 8.8 present the calculations of the ICRs). Results of the risk characterization for Site 3 are discussed in Section 4.2.

1.4.1 Comparison of Quantitative Risk Estimates to Benchmarks

In order to interpret the quantitative risks and to aid risk managers in determining the need for remediation at a site, quantitative risk estimates are compared to typical benchmarks. The USEPA has defined the range of $1x10^{-6}$ to $1x10^{-4}$ as the ILCR "target range" for most hazardous waste facilities addressed under CERCLA. Cumulative ILCRs greater than $1x10^{-4}$ generally will indicate that some degree of remediation is required, while ILCRs below $1x10^{-6}$ normally will not result in remedial efforts. Whenever ILCRs fall between $1x10^{-4}$ and $1x10^{-6}$, decisions for remediation will be made on a case-specific basis. Individual chemicals contributing significantly to risks above the target range are considered to be chemicals of concern.

An HI exceeding unity (1.0) indicates that there may be potential noncarcinogenic health risks associated with exposure. If an HI exceeds unity, target organ effects from individual PCOCs contributing to the risk are considered. Only those chemicals that impact the same target organ(s) or exhibit similar critical effect(s) will be regarded as truly additive. Thus, PCOCs contributing to an HI greater than 1.0 on the basis of a single target organ/effect are considered to be chemicals of concern.

1.4.2 Risk Characterization Results

This section summarizes the results of the risk characterization for post-removal conditions at Site 3. Potential risks for the reasonable maximum exposure (RME) for soil and sediment are summarized in Table 3 and risks for the central tendency exposure (CTE) are presented in Table 4. Chemical specific-risks and total risks are presented in Tables 9.1 through 9.8 in Appendix B. A discussion of the estimated noncarcinogenic and carcinogenic risks is provided in the remainder of this section.

1.4.2.1 Risk Characterization Results for Surface/Subsurface Soil

Noncarcinogenic Risks

Estimated HIs from exposure to combined surface/subsurface post-removal soil at Site 3 are presented in Tables 3 and 4 for the RME and CTE, respectively. The cumulative HIs (the sum of Hazard Quotients for each COPC) for all receptors are less than the USEPA target of unity (1) for noncarcinogenic health effects. Therefore, no adverse noncarcinogenic health effects are expected from exposure to post-removal soil at Site 3 under the RME and CTE exposure conditions specified in the RFI and in Appendix B of this addendum.

Carcinogenic Risks

Estimated cancer risks (ILCRs) from exposure to soil at Site 3 are presented in Tables 3 and 4 for the RME and CTE, respectively. Under RME conditions, ILCRs for all receptors are within the USEPA's risk management range, $1x10^{-6}$ to $1x10^{-4}$. The risks exceeding $1.0x10^{-6}$ are due to exposure to PAHs and Aroclor-1260. For the CTE, the cumulative cancer risks for maintenance/utility workers, construction workers, adult recreational users, and adolescent trespassers are less than $1.0x10^{-6}$ (Table 4). CTE risks for full time workers, day care center children and future residents are within the USEPA's risk management range. As indicated previously, cancer risks less than $1.0x10^{-6}$ are considered acceptable and generally do not require remediation, whereas risk management decisions are necessary if potential risks fall within the risk management range.

1.4.2.2 Risk Characterization Results for Sediment

This section presents potential risks calculated for exposure to sediment at Site 3. The potential receptors evaluated for exposure to sediment are maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, and child and adult residents. The risks calculated for exposure to sediment are presented in Tables 3 and 4 for the RME and CTE scenarios, respectively.

Noncarcinogenic Risks

The cumulative HIs for maintenance/utility workers and adult recreational users, and adolescent trespassers are less than unity (1). The cumulative HIs for construction workers (HI = 3.0), adult residents (HI = 1.4), and child residents (HI = 12) are greater than unity. Aroclor-1254 (adult HI = 1.1, child HI = 8.9) accounts for approximately 75 percent of the noncarcinogenic risks for sediment and iron (adult HI = 0.13, child HI = 1.3) accounts for 10 percent of the total sediment HI.

For the CTE, the cumulative HIs for maintenance/utility workers, adult recreational users, adolescent trespassers, and adult residents are less than unity. The cumulative HIs for construction workers and child residents are greater than unity because of exposure to Aroclor-1254.

Carcinogenic Risks

Under RME conditions (Table 3), ILCRs for maintenance/utility workers, construction workers, adult recreational users, and adolescent trespassers are within the USEPA's risk management range, $1x10^{-6}$ to $1x10^{-4}$. The ILCR for future residents (adult + child ILCR = $1.1x10^{-4}$) slightly exceeds $1x10^{-4}$. PCBs (Aroclor-1254 and Aroclor-1260) account for 60 percent of the sediment ILCRs, PAHs, for approximately 22 percent, and arsenic, for approximately 15 percent of the total risk. Note that the sediment risks for all PCOCs, except Aroclor-1254, Aroclor-1260, mercury, and silver, are based on exposure to maximum

detected concentrations. In addition, the exposure factors for sediment (i.e., exposure frequency, duration, etc.) are assumed to be the same as those for soil. Therefore, the risks calculated for sediment are likely to be overestimated.

For the CTE, the ILCRs for maintenance/utility workers and adult recreational users are less than $1.0x10^{-6}$ and CTE risks for construction workers, day care center children and future residents are within the USEPA's risk management range (Table 4).

As indicated previously, cancer risks less than $1.0x10^{-6}$ are considered acceptable and generally do not require remediation, whereas risk management decisions are necessary if potential risks fall within the risk management range. Cumulative ILCRs greater than $1x10^{-4}$ generally indicate that some degree of remediation is required.

1.5 Uncertainty Analysis

General uncertainties associated with the risk assessment for Site 3 are discussed in Sections 2.8.5 and 8.5.4 of the RFI. Uncertainties associated with the calculation of risk in this addendum are addressed in this section.

Some uncertainty associated with the identification of metals as PCOCs still exists. A statistical analysis (Wilcoxon Rank-Sum Test) of site metal concentrations compared to site-specific background concentrations was conducted to determine if site concentrations are significantly greater than the background concentrations. If they are significantly greater than background, and the maximum detected concentrations are greater than the screening level, i.e., one-tenth the RBC for noncarcinogens and the RBC for carcinogens, they are identified as PCOCs. If the site concentration is not significantly greater than the background concentration, the metal is not identified as a PCOC, even if its maximum concentration is greater than the screening level. The statistical analysis accounts for the variability in concentrations. However, at times, a review of the data may suggest that certain metals should be identified as PCOCs even when the statistical analysis indicates otherwise.

A review of the Site 3 metals data for soil indicates that only the maximum detected concentrations of antimony, copper, mercury, silver, and vanadium were greater than the upper confidence limits of the mean (UCLs) of the facility background concentrations and greater than their risk-based screening levels. Antimony, copper, mercury, and silver were selected as PCOCs and the risks calculated for these constituents were less than unity. The UCL for vanadium slightly exceeded the UCL of the facility background concentration and the risk-based screening level. However, the HI calculated for vanadium for the most sensitive receptor (i.e., the future child resident) is 0.16 and the total HI is less than unity, on

a target organ basis. Therefore, overall, it is appropriate to identify only antimony, copper, mercury, and silver as the only inorganic PCOCs in the risk assessment for soil.

No constituents detected in sediment were eliminated as PCOCs on the basis of background. Therefore, the uncertainty associated with elimination of chemicals on the basis of the statistical background tests is negligible.

With regard to protection of groundwater, only benzo(a)anthracene, carbazole, antimony, and silver were present in soil with maximum detected concentrations greater than the soil screening level for protection of groundwater associated with a dilution-attenuation factor (DAF) of 20 (Table 1). The Site 3 UCL concentration for benzo(a)anthracene is less than the groundwater protection screening level and neither benzo(a)anthracene nor carbazole which have very low solubilities in water were detected in any groundwater samples collected at the site. Likewise, antimony and silver were not detected in any groundwater samples. Based on the soil and groundwater data for Site 3, it is unlikely that the concentrations of these constituents in soil pose any adverse impacts to groundwater.

1.6 Summary and Conclusions

A risk evaluation was performed for soil and sediment at Site 3, NWSC, White Oak. The data used for the soil and sediment evaluation represent post-removal conditions at the site. Potential receptors include full time workers, maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, day care center children, and hypothetical child and adult residents. The receptors were evaluated for exposure to soil by dermal contact and ingestion and semiquantitavely for exposure to air assumed to be impacted by particulate and vapor emissions from soil.

The list of PCOCs for soil includes benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, PCBs - Aroclor-1260, antimony, copper, mercury, silver

The list of PCOCs for sediment includes benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, Aroclor-1254, Aroclor-1260, 4,4'-DDT, aluminum, antimony, arsenic, cadmium, chromium, copper, iron, manganese, mercury, vanadium

Quantitative estimates of noncarcinogenic and carcinogenic risks were developed for the potential receptors.

Exposure to Soil

Estimated HIs from exposure to combined surface/subsurface post-removal soil at Site 3 are presented in Tables 3 and 4. The cumulative HIs (the sum of Hazard Quotients for each COPC) for all receptors are less than the USEPA target of unity (1) for noncarcinogenic health effects. Therefore, no adverse noncarcinogenic health effects are expected from exposure to post-removal soil at Site 3 under the RME and CTE exposure conditions specified in the RFI and in Appendix B of this addendum. ILCRs for all receptors are within the USEPA's risk management range, $1x10^{-6}$ to $1x10^{-4}$. The risks exceeding $1.0x10^{-6}$ are due to exposure to PAHs and Aroclor-1260. As indicated previously, cancer risks less than $1.0x10^{-6}$ are considered acceptable and generally do not require remediation, whereas risk management decisions are necessary if potential risks fall within the risk management range.

Exposure to Sediment

The cumulative HIs for maintenance/utility workers and adult recreational users, and adolescent trespassers are less than unity (1). The cumulative HIs for construction workers (HI = 3.0), adult residents (HI = 1.4), and child residents (HI = 12) are greater than unity. Aroclor-1254 (adult HI = 1.1, child HI = 8.9) accounts for approximately 75 percent of the noncarcinogenic risks for sediment and iron (adult HI = 0.13, child HI = 1.3) accounts for 10 percent of the total sediment HI.

ILCRs for maintenance/utility workers, construction workers, adult recreational users, and adolescent trespassers are within the USEPA's risk management range, $1x10^{-6}$ to $1x10^{-4}$. The ILCR for future residents (adult + child ILCR = $1.1x10^{-4}$) slightly exceeds $1x10^{-4}$. PCBs (Aroclor-1254 and Aroclor-1260) account for 60 percent of the sediment ILCRs, PAHs, for approximately 22 percent, and arsenic, for approximately 15 percent of the total risk. As stated above, the sediment risks for all PCOCs, except Aroclor-1254, Aroclor-1260, mercury, and silver, are based on exposure to maximum detected concentrations. In addition, the exposure factors for sediment (i.e., exposure frequency, duration, etc.) are assumed to be the same as those for soil. Therefore, the risks calculated for sediment are likely to be overestimated.

In summary, estimated potential carcinogenic and noncarcinogenic health hazards associated with exposure to residual soil at Site 3 are expected to be less than or within USEPA target goals under residential and industrial land use. For exposure to sediment, estimated potential carcinogenic and noncarcinogenic health hazards exceeded the USEPA benchmark for residential land use, mainly from exposure to PCBs. The risks from sediment may be overestimated because they are mainly based on exposure to maximum concentrations and conservative exposure assumptions.

2.0 ECOLOGICAL RISK ASSESSMENT

A phased Ecological Risk Assessment (ERA) has been conducted at the former NSWC-White Oak to characterize the potential risks to ecological receptors from site-related chemicals at Site 3. A Basewide Screening-Level Ecological Risk Assessment (SERA) (TtNUS, 1999) was first completed for all sites at the former NSWC-White Oak. Contaminant concentrations detected in sediment samples from Westfarm Branch were compared to conservative ecological screening criteria during the SERA to determine ecological contaminants of potential concern (COPCs). The SERA, consists of the first two of eight steps required by EPA guidance (EPA, 1997 and 1998) and Navy Policy for conducting Ecological Risk Assessments (ERAs). The retained COPCs were further evaluated in Step 3A of the ERA process during the development of the Work Plan for the Basewide ERA (TtNUS, 2000). The Work Plan was developed as part of Steps 3b through 5 of the ERA process and consisted of a sampling and analysis program to collect site-specific toxicity and bioaccumulation data. This information was collected to evaluate site-specific risks to the ecological receptors and to develop chemical concentrations in the soil and sediment that are not expected to pose an unacceptable risk to the receptors. The sampling program was completed in November 2000. The results of the sampling effort and the final evaluation of the COPCs are summarized in the Baseline ERA (BERA) (TtNUS, March 2001), and constitute Steps 6 and 7 of the ERA process.

Risks to aquatic receptors and piscivorous wildlife from chemicals in Westfarm Branch were determined to be low based on the results of historic data (TtNUS, 2001). However, during the removal action at Site 3, some chemicals (mercury, silver, and PCBs) may have been migrated into Westfarm Branch. Therefore, risks to potential ecological receptors are being reevaluated in this report based on additional data collected in April 2002.

2.1 Habitat Types and Ecological Receptors

A detailed description of Westfarm Branch is presented in the Baseline ERA (TtNUS 2001). In summary, the stream supports a benthic community and a small fish population (consisting of American eel, black-nosed dace, creek chub, cutlips minnows, northern hogsucker, pearly dace, rosyside dace, and fathead minnows) based on the results of biological surveys conducted during the 1992 RFI (Malcom Pirnie, 1992). In addition, crayfish, salamander larvae, and leopard frogs were found to inhabit the stream (Malcolm Pirnie, 1992). The results of the benthic macroinvertebrates sampling found that the Westfarm Branch station was dominated by EPT (Ephemeroptera, Plecoptera, and Trichoptera) taxa, which are considered indicative of healthy streams (GSA, 1997)

Ecological receptors could be directly exposed to chemicals in stream (i.e., fish and aquatic invertebrates) and indirectly via the food chain (i.e., through the ingestion of fish and invertebrates).

2.2 Assessment and Measurement Endpoints

The assessment endpoints were the protection of the following groups of receptors from adverse effects of contaminants on their growth, survival, and reproduction: piscivorous mammals and birds, benthic invertebrates, and fish.

Measurement endpoints are estimates of biological impacts (e.g., mortality, growth, and reproduction) that are used to evaluate the assessment endpoints. The following measures of effect were used to evaluate the assessment endpoints in this ERA, where applicable.

- No observed adverse effects levels (NOAELs) for surrogate wildlife species - Mortality, reproductive, and/or developmental effects of birds and mammals were evaluated by comparing sediment concentrations to the risk-based concentrations developed in the Baseline Ecological Risk Assessment (TtNUS, 2001).

- Sediment screening values – Mortality of benthic macroinvertebrates were evaluated by comparing the measured concentrations (maxima and averages) of chemicals in the sediment to literature-based screening values designed to be protective of ecological receptors and risk-based concentrations developed in the Baseline Ecological Risk Assessment (TtNUS, 2001).

2.3 Risk Evaluation

The Baseline Ecological Risk Assessment (BERA) for NSWC White Oak developed Basewide sediment risk-based level for several chemicals (TtNUS, 2001). The sediment levels were developed for total PCBs and mercury as follows:

- PCBs: The level based on risks to piscivorous wildlife was 0.073 mg/kg for an average concentration in a water body. This value was developed using site-specific bioaccumulation data. The level based on risks to benthic invertebrates was 1 mg/kg based on literature data.

- Mercury: The level based on risks to benthic invertebrates was 1.3 mg/kg based on site-specific toxicity test data.

Table 5 summarizes the results of the April 2002 sampling event. There may be some isolated risks to benthic invertebrates from mercury and silver in the sediment because the concentrations at one location exceeded the site-specific risk-based level of 1.3 mg/kg for mercury, and the Effects Range-Median (ER-M) of 3.7 for silver (Long et al., 1995) (see Figure 1). No other detections of silver exceeded the Effects

Range-Low (ER-L) of 1 mg/kg (Long et al., 1995). Because the spatial extent of the mercury and silver contamination is small and bounded in the upstream and downstream samples (within a few hundred feet), risks to the benthic invertebrate population in Westfarm Branch are expected to be low. Therefore, no further evaluation of mercury and silver for risks to benthic invertebrates appears to be warranted.

The levels of PCBs in the sediment at four locations exceeded the 1 mg/kg level established in the Baseline Ecological Risk Assessment for the protection of benthic invertebrates (TtNUS, 2001). Therefore, there may be some isolated impacts to the benthic community in those areas, but the overall benthic community in Westfarm Branch should not be impacted.

With the exception of the furthest upgradient sample, PCBs were detected in all of the samples at concentrations that exceeded the risk-based level of 0.073 mg/kg. Therefore, there are potential risks to piscivorous wildlife that consume fish from Westfarm branch.

As presented in the Baseline Ecological Risk Assessment for the Base, fish tissue PCB concentrations were predicted using the following equation (TtNUS, 2001):

$$Cf = (BSAF * Cs * \% Lipids)/(\% TOC)$$

Where:

- Cf = PCB concentration in fish (mg/kg)
- BSAF = Sediment to fish bioaccumulation factor = 1.289 (based on site-specific data)
- Cs = Average PCB sediment concentration in Westfarm Branch (1.827 mg/kg)
- % Lipids = Percent lipids in fish (assume 3.56 percent, calculated from sunfish results in USEPA, 1997)
- % TOC = Percent total organic carbon in sediment (0.117 percent based on data from Westfarm Branch)

Based on the above input parameters, the predicted PCB concentration in fish in Westfarm Branch is approximately 72 mg/kg. There are no established fish tissue residue concentrations that can be used to evaluate risks to the fish. Data in the literature was used to set 5 percent (1.4 mg/kg) and 50 percent (48.6 mg/kg) probability levels for lowest observed adverse effects levels (LOAELs) for fish tissue residue data (TtNUS, 2001). It is assumed that below the 5 percent level, the probability of effects is low, and above the 50 percent level, the probability of effects is high. Therefore, the predicted PCB concentration in fish in Westfarm Branch is greater than the 50 percent level, which indicates that some effects to fish in Westfarm Branch may occur.

2.4 Summary/Recommendations

In summary, there may be some isolated impacts to the benthic community due to elevated concentrations of mercury, silver, and PCBs, however it is unlikely that the benthic community as a whole in Westfarm Branch is being impacted.

There are potential impacts to the fish community and piscivorous wildlife from PCBs in the sediment that may accumulate in the fish tissue. Note that the predicted fish tissue concentrations are based on BSAFs that were calculated from earthworm bioaccumulation studies at another stream at the Base. Therefore, there are some uncertainties associated with the BSAFs, and the predicted fish tissue concentrations. To decrease the uncertainties in the risk evaluation, fish tissue samples could be collected from Westfarm Branch to determine actual fish tissue concentrations. Also, it is recommended that sediment sampling be conducted in Paint Branch to determine if PCBs from Westfarm Branch have migrated to Paint Branch.

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TABLE 1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
67-64-1	Acetone	0.005	J	0.006	J	mg/kg	003-SS-04	4/10	0.012 - 0.013	0.006	NA	780	N	16 100000	SSL_MIGR SSL_INH	No	BSL
108-90-7	Chlorobenzene	0.004	J	0.004	J	mg/kg	003-SS-02	1/10	0.011 - 0.013	0.004	NA	160	N	1 130	SSL_MIGR SSL_INH	No	BSL
540-59-0	1,2-Dichloroethene (total)	0.015		0.015		mg/kg	003-SS-02	1/10	0.011 - 0.013	0.015	NA	70	N	0.4 1200	SSL_MIGR SSL_INH	No	BSL
78-93-3	Methyl Ethyl Ketone	0.005	J	0.006	J	mg/kg	003-SS-10	3/10	0.012 - 0.013	0.006	NA	4700	N	NA	SSL_MIGR SSL_INH	No	BSL
591-78-6	2-Hexanone	0.0006	J	0.0007	J	mg/kg	003-SS-10	2/10	0.011 - 0.013	0.0007	NA	310	N	NA	SSL_MIGR SSL_INH	No	BSL
108-10-1	4-Methyl-2-pentanone	0.0008	J	0.0008	J	mg/kg	003-SS-09	1/10	0.012 - 0.013	0.0008	NA	630	N	NA	SSL_MIGR SSL_INH	No	BSL
75-09-2	Methylene Chloride	0.001	J	0.002	J	mg/kg	003-SS-01	7/10	0.011 - 0.013	0.002	NA	85	C	0.02 13	SSL_MIGR SSL_INH	No	BSL
79-01-6	Trichloroethene	0.001	J	0.025		mg/kg	003-SS-02	2/10	0.011 - 0.013	0.025	NA	58	N	0.06 5	SSL_MIGR SSL_INH	No	BSL
83-32-9	Acenaphthene	0.71	J	0.71	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.71	NA	470	N	570	SSL_MIGR SSL_INH	No	BSL
120-12-7	Anthracene	0.042	J	2.8		mg/kg	003-SS-01	4/10	0.37 - 0.78	2.8	NA	2300	N	12000	SSL_MIGR SSL_INH	No	BSL
56-55-3	Benzo(a)anthracene	0.097	J	2.4		mg/kg	003-SS-01	5/10	0.37 - 0.83	2.4	NA	0.87	C	2	SSL_MIGR SSL_INH	Yes	ASL
50-32-8	Benzo(a)pyrene	0.075	J	1.8		mg/kg	003-SS-01	5/10	0.37 - 0.83	1.8	NA	0.087	C	8	SSL_MIGR SSL_INH	Yes	ASL
205-99-2	Benzo(b)fluoranthene	0.11	J	2.3		mg/kg	003-SS-01	5/10	0.37 - 0.83	2.3	NA	0.87	C	5	SSL_MIGR SSL_INH	Yes	ASL
191-24-2	Benzo(g,h,i)perylene	0.16	J	0.76	J	mg/kg	003-SS-01	2/10	0.37 - 0.83	0.76	NA	160(6)	N	84	SSL_MIGR SSL_INH	No	BSL
207-08-9	Benzo(k)fluoranthene	0.041	J	1.1	J	mg/kg	003-SS-01	3/10	0.37 - 0.83	1.1	NA	8.7	C	49	SSL_MIGR SSL_INH	No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.12	J	1.8		mg/kg	003-SS-02	2/10	0.37 - 1.5	1.8	NA	46	C	3600 31000	SSL_MIGR SSL_INH	No	BSL
86-74-8	Carbazole	0.8	J	0.8	J	mg/kg	003-SS-01	1/10	0.37 - 1.8	0.8	NA	32	C	0.6	SSL_MIGR SSL_INH	No	BSL
218-01-9	Chrysene	0.1	J	2.4		mg/kg	003-SS-01	5/10	0.37 - 0.83	2.4	NA	87	C	160	SSL_MIGR SSL_INH	No	BSL
84-74-2	Di-n-butyl phthalate	0.054	J	0.14	J	mg/kg	003-SS-02	2/10	0.37 - 1.5	0.14	NA	780	N	2300 2300	SSL_MIGR SSL_INH	No	BSL

TABLE 1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
53-70-3	Dibenzo(a,h)anthracene	0.22	J	0.22	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.22	NA	0.087	C	2	SSL_MIGR SSL_INH	Yes	ASL
132-64-9	Dibenzofuran	0.41	J	0.41	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.41	NA	31	N	NA	SSL_MIGR SSL_INH	No	BSL
206-44-0	Fluoranthene	0.18	J	8.2		mg/kg	003-SS-01	5/10	0.37 - 0.83	8.2	NA	310	N	4300	SSL_MIGR SSL_INH	No	BSL
86-73-7	Fluorene	1.1	J	1.1	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	1.1	NA	310	N	560	SSL_MIGR SSL_INH	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.15	J	0.77	J	mg/kg	003-SS-01	2/10	0.37 - 0.83	0.77	NA	0.87	C	14	SSL_MIGR SSL_INH	No	BSL
91-20-3	Naphthalene	0.28	J	0.28	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.28	NA	160	N	84	SSL_MIGR SSL_INH	No	BSL
85-01-8	Phenanthrene	0.05	J	7.6		mg/kg	003-SS-01	6/10	0.37 - 0.41	7.6	NA	160(6)	N	84	SSL_MIGR SSL_INH	No	BSL
129-00-0	Pyrene	0.085	J	5.4		mg/kg	003-SS-01	6/10	0.37 - 0.41	5.4	NA	230	N	4200	SSL_MIGR SSL_INH	No	BSL
120-82-1	1,2,4-Trichlorobenzene	0.072	J	0.34	J	mg/kg	003-SS-01	4/10	0.37 - 0.83	0.34	NA	78	N	5 3200	SSL_MIGR SSL_INH	No	BSL
5103-74-2	gamma-Chlordane	0.073		0.073		mg/kg	003-SS-03	1/10	0.0019 - 0.041	0.073	NA	1.8(7)	C	10 20	SSL_MIGR SSL_INH	No	BSL
72-54-8	4,4'-DDD	0.014	J	0.078		mg/kg	003-SS-06	10/10	---	0.078	NA	2.7	C	16	SSL_MIGR SSL_INH	No	BSL
72-55-9	4,4'-DDE	0.0012	J	0.032	J	mg/kg	003-SS-01	7/10	0.039 - 0.08	0.032	NA	1.9	C	54	SSL_MIGR SSL_INH	No	BSL
50-29-3	4,4'-DDT	0.023	J	0.71		mg/kg	003-SS-02	10/10	---	0.71	NA	1.9	C	32	SSL_MIGR SSL_INH	No	BSL
11096-82-5	Aroclor-1260	0.057		4.9		mg/kg	003-SS-01	10/10	---	4.9	NA	0.32	C	NA	SSL_MIGR SSL_INH	Yes	ASL
7429-90-5	Aluminum	1820		20100		mg/kg	003-SS-05	10/10	---	20100	NA	7800	N	NA	SSL_MIGR SSL_INH	No	BKG
7440-36-0	Antimony	0.9	J	13.5	J	mg/kg	003-SS-03	4/10	13.6 - 15.1	13.5	NA	3.1	N	5	SSL_MIGR SSL_INH	Yes	ASL
7440-38-2	Arsenic	0.7	J	4		mg/kg	003-SS-05	10/10	---	4	NA	0.43	C	29 750	SSL_MIGR SSL_INH	No	BKG
7440-39-3	Barium	14	J	101		mg/kg	003-SS-02	10/10	---	101	NA	550	N	1600 690000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-41-7	Beryllium	0.14	J	0.14	J	mg/kg	003-SS-10	1/10	1.1 - 1.3	0.14	NA	16		63 1300	SSL_MIGR SSL_INH	No	BSL

TABLE 1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7440-43-9	Cadmium	0.21	J	2.3		mg/kg	003-SS-02	6/10	1.1 - 1.3	2.3	NA	7.8	N	8 1800	SSL_MIGR SSL_INH	No	BSL
7440-70-2	Calcium	206	J	4200		mg/kg	003-SS-06	10/10	---	4200	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT
7440-47-3	Chromium	8		34.5		mg/kg	003-SS-01	10/10	---	34.5	NA	23(8)	N	38 270	SSL_MIGR SSL_INH	No	BKG
7440-48-4	Cobalt	1.5	J	10	J	mg/kg	003-SS-02	10/10	---	10	NA	470	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG
7440-50-8	Copper	2.3		437		mg/kg	003-SS-03	10/10	---	437	NA	310	N	NA	SSL_MIGR SSL_INH	Yes	ASL
7439-89-6	Iron	3700		23800		mg/kg	003-SS-05	10/10	---	23800	NA	2300	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-92-1	Lead	1.9		76.8		mg/kg	003-SS-02	10/10	---	76.8	NA	400(9)		NA	SSL_MIGR SSL_INH	No	BKG
7439-95-4	Magnesium	295	J	2830	J	mg/kg	003-SS-02	10/10	---	2830	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7439-96-5	Manganese	14.3		293		mg/kg	003-SS-02	10/10	---	293	NA	160(10)	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-97-6	Mercury	0.097	J	3.8		mg/kg	003-SS-02	10/10	---	3.8	NA	2.3(11)	N	NA	SSL_MIGR SSL_INH	No	BSL
7439-98-7	Molybdenum	0.44	J	2.1		mg/kg	003-SS-03	7/10	0.91 - 1	2.1	NA	39	N	NA	SSL_MIGR SSL_INH	No	BSL
7440-02-0	Nickel	2.3	J	38.7	J	mg/kg	003-SS-02	10/10	---	38.7	NA	160	N	130 13000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-09-7	Potassium	163	J	856	J	mg/kg	003-SS-02	10/10	---	856	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7782-49-2	Selenium	0.7	J	2.6		mg/kg	003-SS-06	5/10	1.1 - 1.3	2.6	NA	39	N	5	SSL_MIGR SSL_INH	No	BSL
7440-22-4	Silver	0.27	J	147		mg/kg	003-SS-06	6/10	2.3 - 2.5	147	NA	39	N	34	SSL_MIGR SSL_INH	Yes	ASL
7440-23-5	Sodium	393	J	393	J	mg/kg	003-SS-02	1/10	1130 - 1260	393	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT
7440-62-2	Vanadium	3.8		55.7		mg/kg	003-SS-01	10/10	---	55.7	NA	55	N	6000	SSL_MIGR SSL_INH	No	BKG
7440-66-6	Zinc	9.5		1010		mg/kg	003-SS-02	10/10	---	1010	NA	2300	N	12000	SSL_MIGR SSL_INH	No	BSL

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

TABLE 1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)	Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)

Footnotes:
1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a PCOC.
4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).
5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level and facility-wide background levels.
6 Naphthalene is used as a surrogate for benzo(g,h,I)perylene and phenanthrene.
7 Value for chlordane is used.
8 Chromium as hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 1994)
10 Manganese-Nonfood.
11 Mercury as Mercuric Chloride.

Associated Samples:

003-SS-01	003-SS-06
003-SS-02	003-SS-07
003-SS-03	003-SS-08
003-SS-04	003-SS-09
003-SS-05	003-SS-10

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
NUT = Essential Nutrient

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
SSL-MIGR = Soil Screening Level for transfers from soil to groundwater for a Dilution and Attenuation Factor of 20 (USEPA, May 1996)

TABLE 2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
75-09-2	Methylene Chloride	0.001	J	0.002	J	mg/kg	0003-SD-02	4/6	0.012 - 0.016	0.002	NA	85	N	No	BSL
83-32-9	Acenaphthene	0.16	J	0.28	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.28	NA	470	N	No	BSL
120-12-7	Anthracene	0.37	J	0.68	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.68	NA	2300	N	No	BSL
56-55-3	Benzo(a)anthracene	0.16	J	1.3		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.3	NA	0.87	C	Yes	ASL
50-32-8	Benzo(a)pyrene	0.2	J	1.2		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.2	NA	0.087	C	Yes	ASL
205-99-2	Benzo(b)fluoranthene	0.27	J	1.7		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.7	NA	0.87	C	Yes	ASL
191-24-2	Benzo(g,h,i)perylene	0.34	J	0.43	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.43	NA	160(6)	N	No	BSL
207-08-9	Benzo(k)fluoranthene	0.43	J	0.58	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.58	NA	8.7	C	No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.14	J	0.25	J	mg/kg	0003-SD-03	3/6	0.78 - 0.98	0.25	NA	46	C	No	BSL
218-01-9	Chrysene	0.18	J	1.1		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.1	NA	87	C	No	BSL
53-70-3	Dibenzo(a,h)anthracene	0.13	J	0.13	J	mg/kg	0003-SD-02	1/6	0.78 - 1.0	0.13	NA	0.087	C	Yes	ASL
132-64-9	Dibenzofuran	0.15	J	0.15	J	mg/kg	0003-SD-02	1/6	0.78 - 1.1	0.15	NA	31	N	No	BSL
206-44-0	Fluoranthene	0.32	J	2.6		mg/kg	0003-SD-02	3/6	0.78 - 0.98	2.6	NA	310	N	No	BSL
86-73-7	Fluorene	0.22	J	0.34	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.34	NA	310	N	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.32	J	0.41	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.41	NA	0.87	C	No	BSL
91-20-3	Naphthalene	0.11	J	0.11	J	mg/kg	0003-SD-02	1/6	0.78 - 1.1	0.11	NA	160	N	No	BSL
85-01-8	Phenanthrene	0.18	J	2.4		mg/kg	0003-SD-02	3/6	0.78 - 0.98	2.4	NA	160(6)	N	No	BSL
129-00-0	Pyrene	0.32	J	2.2		mg/kg	0003-SD-02	3/6	0.78 - 0.98	2.2	NA	230	N	No	BSL
120-82-1	1,2,4-Trichlorobenzene	0.21	J	0.21	J	mg/kg	0003-SD-01	1/6	0.78 - 1.1	0.21	NA	78	N	No	BSL
5103-71-9	alpha-Chlordane	0.0018	J	0.24		mg/kg	0003-SD-01	3/6	0.02 - 0.28	0.24	NA	1.8(7)	C	No	BSL

TABLE 2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
5103-74-2	gamma-Chlordane	0.0011	J	0.19		mg/kg	0003-SD-01	3/6	0.02 - 0.28	0.19	NA	1.8(7)	C	No	BSL
72-54-8	4,4'-DDD	0.27		0.27		mg/kg	0003-SD-01	1/6	0.0049 - 0.54	0.27	NA	2.7	C	No	BSL
50-29-3	4,4'-DDT	0.0018	J	5.3		mg/kg	0003-SD-03	5/6	0.0049	5.3	NA	1.9	C	Yes	ASL
11097-69-1	Aroclor-1254	0.031		10		mg/kg	03SD0020006	12/12	---	10	NA	0.32	C	Yes	ASL
11096-82-5	Aroclor-1260	0.015		8.8		mg/kg	03SD0020006	3/12	0.039 - 0.41	8.8	NA	0.32	C	Yes	ASL
7429-90-5	Aluminum	2270		17400		mg/kg	0003-SD-03	6/6	---	17400	NA	7800	N	Yes	ASL
7440-36-0	Antimony	1.4	J	3.3	J	mg/kg	0003-SD-03	3/6	14.2 - 17.8	3.3	NA	3.1	N	Yes	ASL
7440-38-2	Arsenic	2.4	J	6.8		mg/kg	0003-SD-01	6/6	---	6.8	NA	0.43	C	Yes	ASL
7440-39-3	Barium	31.2	J	276		mg/kg	0003-SD-03	6/6	---	276	NA	550	N	No	BSL
7440-43-9	Cadmium	0.94	J	8.8		mg/kg	0003-SD-03	4/6	1.5	8.8	NA	7.8	N	Yes	ASL
7440-70-2	Calcium	196	J	3630		mg/kg	0003-SD-06	6/6	---	3630	NA	NA		No	NUT
7440-47-3	Chromium	8.7		43.9		mg/kg	0003-SD-03	6/6	---	43.9	NA	23(8)	N	Yes	ASL
7440-48-4	Cobalt	3.6	J	15.5	J	mg/kg	0003-SD-03	6/6	---	15.5	NA	470	N	No	BSL
7440-50-8	Copper	7.7		370		mg/kg	0003-SD-03	6/6	---	370	NA	310	N	Yes	ASL
7439-89-6	Iron	8450		29300		mg/kg	0003-SD-03	6/6	---	29300	NA	2300	N	Yes	ASL
7439-92-1	Lead	5.4		211		mg/kg	0003-SD-03	6/6	---	211	NA	400(9)		No	BSL
7439-95-4	Magnesium	1220	J	2520		mg/kg	0003-SD-03	6/6	---	2520	NA	NA		No	NUT, BKG
7439-96-5	Manganese	178		1000		mg/kg	0003-SD-03	6/6	---	1000	NA	160(10)	N	Yes	ASL
7439-97-6	Mercury	0.04		6.2		mg/kg	03SD0020006	10/11	0.04	6.2	NA	2.3(11)	N	Yes	ASL
7439-98-7	Molybdenum	0.77	J	6.5		mg/kg	0003-SD-03	6/6	---	6.5	NA	39	N	No	BSL

TABLE 2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7440-02-0	Nickel	12.4		68.6		mg/kg	0003-SD-03	6/6	---	68.6	NA	160	N	No	BSL
7440-09-7	Potassium	153	J	909	J	mg/kg	0003-SD-03	6/6	---	909	NA	NA		No	NUT, BKG
7782-49-2	Selenium	1	J	3.1		mg/kg	0003-SD-03	6/6	---	3.1	NA	39	N	No	BSL
7440-22-4	Silver	0.026		14.8		mg/kg	03SD0020006	11/11	---	14.8	NA	39	N	No	BSL
7440-62-2	Vanadium	7.9	J	77.5		mg/kg	0003-SD-03	6/6	---	77.5	NA	55	N	Yes	ASL
7440-66-6	Zinc	45.6		871		mg/kg	0003-SD-03	6/6	---	871	NA	2300	N	No	BSL

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

Footnotes:

1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a PCOC.
4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).
5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level and facility-wide background levels.
6 Naphthalene is used as a surrogate for benzo(g,h,I)perylene and phenanthrene.
7 Value for chlordane is used.
8 Chromium as hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 1994)
10 Manganese-Nonfood.
11 Mercury as Mercuric Chloride.

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
NUT = Essential Nutrient

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern

Associated Samples (collected in November 2000):

0003-SD-01	0003-SD-04
0003-SD-02	0003-SD-05
0003-SD-03	0003-SD-06

Samples collected in April 2002 and analyzed for PCBs, mercury, and silver:

03SD0010006	03SD0050006	03SD0090006
03SD0020006	03SD0060006	03SD00100006
03SD0030006	03SD0070006	03SD00110006
03SD0040006	03SD0080006	03SD00120006

TABLE 3

CUMULATIVE RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE
SITE 3 - PISTOL RANGE LANDFILL
NSWC - WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	7.2E-02	1.0E-02	2.5E-01	4.6E-03	2.4E-02	3.4E-01	1.0E-01	9.4E-01
Dermal Contact with Surface/Subsurface Soil	6.9E-03	3.5E-04	7.4E-03	4.8E-04	3.5E-03	4.1E-02	5.8E-03	3.8E-02
Total HI for Soil	**7.9E-02**	**1.1E-02**	**2.6E-01**	**5.1E-03**	**2.8E-02**	**3.8E-01**	**1.1E-01**	**9.8E-01**
Incidental Ingestion of Sediment		1.0E-01	2.5E+00	4.6E-02	2.4E-01		1.0E+00	9.3E+00
Dermal Contact with Sediment		2.4E-02	5.1E-01	3.3E-02	2.4E-01		4.0E-01	2.6E+00
Total HI for Sediment		**1.3E-01**	**3.0E+00**	**7.9E-02**	**4.8E-01**		**1.4E+00**	**1.2E+01**
Total Risk:	**7.9E-02**	**1.4E-01**	**3.2E+00**	**8.4E-02**	**5.1E-01**	**3.8E-01**	**1.5E+00**	**1.3E+01**

INCREMENTAL CANCER RISK

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	6.8E-06	9.8E-07	9.4E-07	5.2E-07	9.2E-07	7.6E-06	9.1E-06	2.1E-05
Dermal Contact with Surface/Subsurface Soil	6.1E-06	3.1E-07	2.6E-07	5.1E-07	1.2E-06	8.6E-06	4.9E-06	8.1E-06
Total Risk for Soil	**1.3E-05**	**1.3E-06**	**1.2E-06**	**1.0E-06**	**2.1E-06**	**1.6E-05**	**1.4E-05**	**2.9E-05**
Incidental Ingestion of Sediment		2.5E-06	2.4E-06	1.3E-06	2.4E-06		2.4E-05	5.5E-05
Dermal Contact with Sediment		6.5E-07	5.6E-07	1.1E-06	2.6E-06		1.0E-05	1.7E-05
Total Risk for Sediment		**3.2E-06**	**3.0E-06**	**2.4E-06**	**5.0E-06**		**3.4E-05**	**7.2E-05**
Total Risk:	**1.3E-05**	**4.5E-06**	**4.2E-06**	**3.5E-06**	**7.1E-06**	**1.6E-05**	**4.8E-05**	**1.0E-04**

TABLE 4

CUMULATIVE RISK SUMMARY - CENTRAL TENDENCY EXPOSURE
SITE 3 - PISTOL RANGE LANDFILL
NSWC - WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	3.2E-02	2.6E-03	1.2E-01	1.2E-03	6.1E-03	1.5E-01	3.4E-02	3.1E-01
Dermal Contact with Surface/Subsurface Soil	6.0E-04	2.5E-05	2.5E-03	3.0E-05	2.3E-04	4.8E-03	5.6E-04	5.1E-03
Total HI for Soil	**3.2E-02**	**2.6E-03**	**1.3E-01**	**1.2E-03**	**6.3E-03**	**1.5E-01**	**3.4E-02**	**3.2E-01**
Incidental Ingestion of Sediment		2.6E-02	1.2E+00	1.1E-02	6.0E-02		3.3E-01	3.1E+00
Dermal Contact with Sediment		1.7E-03	1.7E-01	2.1E-03	1.6E-02		3.8E-02	3.5E-01
Total HI for Sediment		**2.7E-02**	**1.4E+00**	**1.3E-02**	**7.6E-02**		**3.7E-01**	**3.5E+00**
Total Risk:	**3.2E-02**	**3.0E-02**	**1.5E+00**	**1.5E-02**	**8.3E-02**	**1.5E-01**	**4.1E-01**	**3.8E+00**

INCREMENTAL CANCER RISK

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	1.1E-06	8.8E-08	4.7E-07	3.9E-08	2.3E-07	1.7E-06	8.9E-07	2.4E-06
Dermal Contact with Surface/Subsurface Soil	1.9E-07	7.9E-09	8.7E-08	9.5E-09	8.1E-08	5.1E-07	1.4E-07	3.6E-07
Total Risk for Soil	**1.3E-06**	**9.6E-08**	**5.6E-07**	**4.9E-08**	**3.1E-07**	**2.2E-06**	**1.0E-06**	**2.7E-06**
Incidental Ingestion of Sediment		2.3E-07	1.2E-06	1.0E-07	5.9E-07		2.3E-06	6.1E-06
Dermal Contact with Sediment		1.7E-08	1.9E-07	2.0E-08	1.7E-07		2.9E-07	7.6E-07
Total Risk for Sediment		**2.4E-07**	**1.4E-06**	**1.2E-07**	**7.7E-07**		**2.6E-06**	**6.9E-06**
Total Risk:	**1.3E-06**	**3.4E-07**	**2.0E-06**	**1.7E-07**	**1.1E-06**	**2.2E-06**	**3.6E-06**	**9.6E-06**

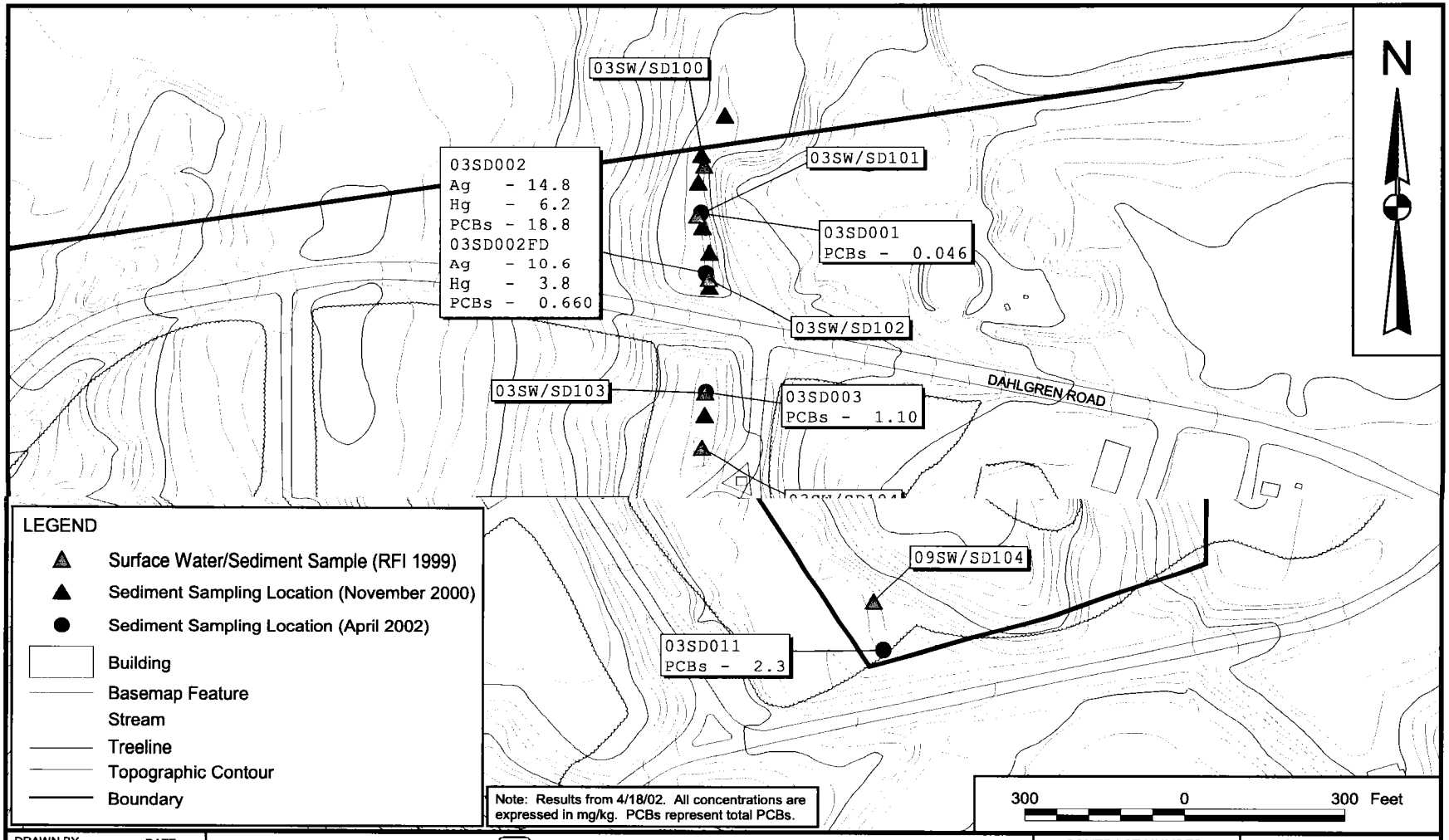
TABLE 5

SUMMARY OF SEDIMENT DATA FROM WESTFARM BRANCH

Sample Numbers	Silver (mg/kg)	Mercury (mg/kg)	Aroclor-1254 (ug/kg)	Aroclor-1260 (ug/kg)
03SD0010006	0.04 BN	0.083	31 J	15 J
03SD0020006	14.8 N	6.2	10000	8800
03SD002FD0006	10.6 N	3.8	660	47 U
03SD0030006	0.076 BN	0.2 B	1100	39 U
03SD0040006	0.12 BN	0.036 B	96	33 J
03SD0050006	0.085 BN	0.044 B	7500	460 U
03SD0060006	0.077 BN	0.053	310	42 U
03SD0070006	0.095 BN	0.11	130	42 U
03SD0080006	0.081 BN	0.027 B	89	39 U
03SD0090006	0.097 BN	0.04 U	190	40 U
03SD0100006	0.095 BN	0.043	340	42 U
03SD0110006	0.093 BN	0.028 B	2300	210 U
03SD0120006	Not Analyzed		65	40 U
Average Total PCB Concentration[1]			**1,827**	

1 - The average concentraton was calculated using only positive detections and by averaging the sample and duplicate from 00SD002006 first, before averaging the PCB concentrations in the rest of the samples.

P:\GIS\WHITEOAK\7427_PROPOSALS2.APR SITE3_PROPOSEDLOCATIONS_LAYOUT 7/31/02 AJ



DRAWN BY: K. PEILA — DATE: 4/15/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 7427	OWNER NUMBER: 0273
CHECKED BY: T. JACKMAN — DATE: 7/26/02	SAMPLE LOCATION MAP WESTFARM BRANCH/SITE 3 NWSC WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY: — DATE: 7/29/02	
COST/SCHEDULE-AREA		APPROVED BY: — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE 1	REV: 0

APPENDIX A

ANALYTICAL DATA

SUMMARY OF ANALYTICAL DATA

SOIL

SUMMARY OF ANALYTICAL RESULTS - POST REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

LOCATION	0003-SS-01	0003-SS-02	0003-SS-03	0003-SS-04	0003-SS-05	0003-SS-06	0003-SS-07	0003-SS-08	0003-SS-09	0003-SS-10
NSAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
SAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
MATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC_TYPE	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/16/2000	8/16/2000	8/16/2000
VALIDATED	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)										
1,1,1-TRICHLOROETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
1,1,2-TRICHLOROETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
1,1-DICHLOROETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
1,1-DICHLOROETHENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
1,2-DICHLOROETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
1,2-DICHLOROPROPANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
2-BUTANONE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
2-HEXANONE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
4-METHYL-2-PENTANONE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
ACETONE	12 UJ	12 UJ	12 UJ	6 B	13 UJ	12 UJ	12 UJ	13 U	11 U	12 U
BENZENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
BROMODICHLOROMETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
BROMOFORM	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
BROMOMETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
CARBON DISULFIDE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
CARBON TETRACHLORIDE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
CHLOROBENZENE	12 U	4 J	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
CHLORODIBROMOMETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
CHLOROETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 UJ	11 UJ	12 UJ
CHLOROFORM	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
CHLOROMETHANE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
ETHYLBENZENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
METHYLENE CHLORIDE	2 B	2 B	2 B	1 B	1 B	2 B	2 B	13 U	11 U	12 U
STYRENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
TETRACHLOROETHENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
TOLUENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
TOTAL 1,2-DICHLOROETHENE	12 U	15	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
TOTAL XYLENES	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
TRICHLOROETHENE	1 J	25	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
VINYL CHLORIDE	12 U	12 U	12 U	12 U	13 U	12 U	12 U	13 U	11 U	12 U
Semivolatile Organics (ug/kg)										
1,2,4-TRICHLOROBENZENE	340 L	800 UL	210 L	72 L	830 UL	780 UL	340 L	410 UL	370 UL	380 UL
1,2-DICHLOROBENZENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
1,3-DICHLOROBENZENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL

SUMMARY OF ANALYTICAL RESULTS - POST REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

LOCATION	0003-SS-01	0003-SS-02	0003-SS-03	0003-SS-04	0003-SS-05	0003-SS-06	0003-SS-07	0003-SS-08	0003-SS-09	0003-SS-10
NSAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
SAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
MATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC_TYPE	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/16/2000	8/16/2000	8/16/2000
VALIDATED	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
1,4-DICHLOROBENZENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2,2'-OXYBIS(1-CHLOROPROPANE)	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2,4,5-TRICHLOROPHENOL	3900 UL	2000 UL	1000 UL	1000 UL	2100 UL	2000 UL	1000 UL	1000 UL	940 UL	970 UL
2,4,6-TRICHLOROPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2,4-DICHLOROPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2,4-DIMETHYLPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2,4-DINITROPHENOL	3900 UR	2000 UR	1000 UR	1000 UR	2100 UR	2000 UR	1000 UR	1000 UR	940 UR	970 UR
2,4-DINITROTOLUENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2,6-DINITROTOLUENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2-CHLORONAPHTHALENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2-CHLOROPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2-METHYLNAPHTHALENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2-METHYLPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
2-NITROANILINE	3900 UL	2000 UL	1000 UL	1000 UL	2100 UL	2000 UL	1000 UL	1000 UL	940 UL	970 UL
2-NITROPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
3,3'-DICHLOROBENZIDINE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
3-NITROANILINE	3900 UL	2000 UL	1000 UL	1000 UL	2100 UL	2000 UL	1000 UL	1000 UL	940 UL	970 UL
4,6-DINITRO-2-METHYLPHENOL	3900 UR	2000 UR	1000 UR	1000 UR	2100 UR	2000 UR	1000 UR	1000 UR	940 UR	970 UR
4-BROMOPHENYL PHENYL ETHER	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
4-CHLORO-3-METHYLPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
4-CHLOROANILINE	3100 UL	1600 UL	840 UL	810 UL	1700 UL	1600 UL	810 UL	410 UL	370 UL	380 UL
4-CHLOROPHENYL PHENYL ETHER	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
4-METHYLPHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
4-NITROANILINE	3900 UL	2000 UL	1000 UL	1000 UL	2100 UL	2000 UL	1000 UL	1000 UL	940 UL	970 UL
4-NITROPHENOL	3900 UL	2000 UL	1000 UL	1000 UL	2100 UL	2000 UL	1000 UL	1000 UL	940 UL	970 UL
ACENAPHTHENE	710 J	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
ACENAPHTHYLENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
ANTHRACENE	2800 L	210 J	42 L	400 UL	110 L	780 UL	400 UL	410 UL	370 UL	380 UL
BENZO(A)ANTHRACENE	2400 L	510 J	120 L	400 UL	830 UL	120 L	97 L	410 UL	370 UL	380 UL
BENZO(A)PYRENE	1800 L	440 J	100 L	400 UL	830 UL	130 L	75 L	410 UL	370 UL	380 UL
BENZO(B)FLUORANTHENE	2300 L	650 J	220 L	400 UL	830 UL	150 L	110 L	410 UL	370 UL	380 UL
BENZO(G,H,I)PERYLENE	760 L	160 L	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
BENZO(K)FLUORANTHENE	1100 L	170 L	410 UL	400 UL	830 UL	780 UL	41 L	410 UL	370 UL	380 UL
BIS(2-CHLOROETHOXY)METHANE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
BIS(2-CHLOROETHYL)ETHER	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
BIS(2-ETHYLHEXYL)PHTHALATE	1500 UL	1800 L	120 L	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
BUTYL BENZYL PHTHALATE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
CARBAZOLE	800 J	1800 UL	910 UL	880 UL	1800 UL	1700 UL	880 UL	410 UL	370 UL	380 UL

SUMMARY OF ANALYTICAL RESULTS - POST REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

LOCATION	0003-SS-01	0003-SS-02	0003-SS-03	0003-SS-04	0003-SS-05	0003-SS-06	0003-SS-07	0003-SS-08	0003-SS-09	0003-SS-10
NSAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
SAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
MATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC_TYPE	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/16/2000	8/16/2000	8/16/2000
VALIDATED	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
CHRYSENE	2400 L	490 L	130 L	400 UL	830 UL	140 L	100 L	410 UL	370 UL	380 UL
DI-N-BUTYL PHTHALATE	1500 UL	140 L	54 L	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
DI-N-OCTYL PHTHALATE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
DIBENZO(A,H)ANTHRACENE	220 L	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
DIBENZOFURAN	410 L	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
DIETHYL PHTHALATE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
DIMETHYL PHTHALATE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
FLUORANTHENE	8200 L	1000 L	250 L	400 UL	830 UL	230 L	180 L	410 UL	370 UL	380 UL
FLUORENE	1100 L	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
HEXACHLOROBENZENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
HEXACHLOROBUTADIENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
HEXACHLOROCYCLOPENTADIENE	2100 UL	1100 UL	560 UL	540 UL	1100 UL	1100 UL	540 UL	410 UL	370 UL	380 UL
HEXACHLOROETHANE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
INDENO(1,2,3-CD)PYRENE	770 L	150 L	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
ISOPHORONE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
N-NITROSO-DI-N-PROPYLAMINE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
N-NITROSODIPHENYLAMINE	2000 UL	1000 UL	520 UL	510 UL	1100 UL	1000 UL	510 UL	410 UL	370 UL	380 UL
NAPHTHALENE	280 L	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
NITROBENZENE	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
PENTACHLOROPHENOL	3900 UL	2000 UL	1000 UL	1000 UL	2100 UL	2000 UL	1000 UL	1000 UL	940 UL	970 UL
PHENANTHRENE	7600 L	470 L	120 L	400 UL	110 L	150 L	50 L	410 UL	370 UL	380 UL
PHENOL	1500 UL	800 UL	410 UL	400 UL	830 UL	780 UL	400 UL	410 UL	370 UL	380 UL
PYRENE	5400 L	980 L	290 L	400 UL	85 L	250 L	150 L	410 UL	370 UL	380 UL
Energetics (ug/kg)										
1,3,5-TRINITROBENZENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
1,3-DINITROBENZENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
2,4,6-TRINITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
2,4-DINITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
2,6-DINITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
2-AMINO-4,6-DINITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
2-NITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
3-NITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
4-AMINO-2,6-DINITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
4-NITROTOLUENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
HMX	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
NITROBENZENE	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
RDX	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U
TETRYL	230 U	240 U	250 U	240 U	250 U	240 U	240 U	250 U	230 U	230 U

SUMMARY OF ANALYTICAL RESULTS - POST REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

LOCATION	0003-SS-01	0003-SS-02	0003-SS-03	0003-SS-04	0003-SS-05	0003-SS-06	0003-SS-07	0003-SS-08	0003-SS-09	0003-SS-10
NSAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
SAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
MATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC_TYPE	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/16/2000	8/16/2000	8/16/2000
VALIDATED	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Pesticides/PCB's (ug/kg)										
4,4'-DDD	65 J	73 J	21 J	20 J	14 J	78 J	54 J	23 L	16 L	23 R
4,4'-DDE	32 J	80 UL	41 UL	3.9 J	17 J	39 UL	20 J	1.8 R	1.2 R	11 R
4,4'-DDT	620 J	710 J	210 J	80 J	190 J	270 J	290 J	58 R	23 R	150 R
ALDRIN	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
ALPHA-BHC	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
ALPHA-CHLORDANE	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
AROCLOR-1016	770 UL	800 UJ	410 UJ	79 UJ	420 UJ	390 UJ	400 UJ	41 UL	37 UL	190 UL
AROCLOR-1221	1600 UL	1600 UL	840 UL	160 UL	850 UL	790 UL	810 UL	84 UL	76 UL	390 UL
AROCLOR-1232	770 UL	800 UL	410 UL	79 UL	420 UL	390 UL	400 UL	41 UL	37 UL	190 UL
AROCLOR-1242	770 UL	800 UL	410 UL	79 UL	420 UL	390 UL	400 UL	41 UL	37 UL	190 UL
AROCLOR-1248	770 UL	800 UL	410 UL	79 UL	420 UL	390 UL	400 UL	41 UL	37 UL	190 UL
AROCLOR-1254	770 UL	800 UL	410 UL	79 UL	420 UL	390 UL	400 UL	41 R	37 R	190 R
AROCLOR-1260	4900 L	4200 J	1600 J	580 J	1400 J	1500 J	2000 J	57 J	65 J	610 J
BETA-BHC	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
DELTA-BHC	40 UJ	41 UJ	21 UJ	4.1 UJ	21 UJ	20 UJ	20 UJ	2.1 UL	1.9 UL	9.9 UL
DIELDRIN	77 UL	80 UL	41 UL	7.9 UL	42 UL	39 UL	40 UL	4.1 UL	3.7 UL	19 UL
ENDOSULFAN I	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
ENDOSULFAN II	77 UL	80 UL	41 UL	7.9 UL	42 UL	39 UL	40 UL	4.1 UL	3.7 UL	19 UL
ENDOSULFAN SULFATE	77 UJ	80 UJ	41 UJ	7.9 UJ	42 UJ	39 UJ	40 UJ	4.1 UL	3.7 UL	19 UL
ENDRIN	77 UL	80 UL	41 UL	7.9 UL	42 UL	39 UL	40 UL	4.1 UL	3.7 UL	19 UL
ENDRIN ALDEHYDE	77 UL	80 UL	41 UL	7.9 UL	42 UL	39 UL	40 UL	4.1 UL	3.7 UL	19 UL
ENDRIN KETONE	77 UJ	80 UJ	41 UJ	7.9 UJ	42 UJ	39 UJ	40 UJ	4.1 UL	3.7 UL	19 UL
GAMMA-BHC (LINDANE)	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
GAMMA-CHLORDANE	40 UL	41 UL	73 L	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
HEPTACHLOR	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
HEPTACHLOR EPOXIDE	40 UL	41 UL	21 UL	4.1 UL	21 UL	20 UL	20 UL	2.1 UL	1.9 UL	9.9 UL
METHOXYCHLOR	400 UL	410 UL	210 UL	41 UL	210 UL	200 UL	200 UL	21 UL	19 UL	99 UL
TOXAPHENE	4000 UL	4100 UL	2100 UL	410 UL	2100 UL	2000 UL	2000 UL			
Inorganics (mg/kg)										
ALUMINUM	11000	15700	10300	1820	20100	7340	11900	5380	6390	8290
ANTIMONY	0.72 U	0.9 B	13.5 K	0.75 U	0.78 U	1.1 B	0.75 U	0.78 U	0.7 U	0.93 B
ARSENIC	2.4	3.4	3.5	0.7	4	2.1	1.3	1.6 B	2.2 B	2.1 B
BARIUM	51.5	101	38.7	14	50.5	48.9	77.1	33.2	26.3	45.3
BERYLLIUM	0.07 U	0.07 U	0.08 U	0.07 U	0.08 U	0.07 U	0.072 U	0.075 U	0.068 U	0.14
CADMIUM	0.38	2.3	0.21	0.12 U	0.49	0.7	0.12 U	0.12 U	0.11 U	0.21
CALCIUM	1100	1990	1160	265	1350	4200	607	209	206	534
CHROMIUM	34.5	25.2	24.4	8.3	29.3	14.8	14.7	8	10.8	11.1

SUMMARY OF ANALYTICAL RESULTS - POST REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

LOCATION	0003-SS-01	0003-SS-02	0003-SS-03	0003-SS-04	0003-SS-05	0003-SS-06	0003-SS-07	0003-SS-08	0003-SS-09	0003-SS-10
NSAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
SAMPLE	003-SS-01	003-SS-02	003-SS-03	003-SS-04	003-SS-05	003-SS-06	003-SS-07	003-SS-08	003-SS-09	003-SS-10
MATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC_TYPE	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/16/2000	8/16/2000	8/16/2000
VALIDATED	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
COBALT	4.8	10	6.2	1.5	3.6	3.8	5.2	9.8	4.3	3
COPPER	47.3	104	437	2.3	35.3	45.6	7.4	23.8	13.4	15.3
IRON	17700	22200	18200	3700	23800	11100	12100	13400	17100	9030
LEAD	19.6	76.8	29	1.9	20.2	29	10.2	12.1 L	13.6 L	14.2 L
MAGNESIUM	813	2830	575	342	803	954	910	297	295	598
MANGANESE	94.4	293	260	14.3	96.2	156	103	279	81.6	50.5
MERCURY	0.76	3.8	0.58	0.54	1.4	1.3	0.42	0.097 B	0.13 B	0.18 K
MOLYBDENUM	1.4 B	2 B	2.1 B	0.44 B	0.83 B	1.4 B	0.36 U	0.38 U	0.34 U	0.44 B
NICKEL	12.7	38.7	9.9	2.3	7.3	11.7	5.7	2.4	2.3	6.5
POTASSIUM	416 L	856 L	288 L	192 B	463 L	258 L	578 L	182 L	163 L	212 L
SELENIUM	2	1.3	2	0.51 U	0.53 U	2.6	0.51 U	0.53 U	0.48 U	0.7 K
SILVER	6.6	3.8	2.2	0.14 U	0.38 B	147	0.14 U	0.15 U	0.14 U	0.27
SODIUM	40.3 U	393	43.1 U	41.6 U	43.7 U	41 U	41.7 U	43.4 U	39.2 U	40.3 U
THALLIUM	0.35 U	0.37 U	0.37 U	0.36 U	0.38 U	0.36 U	0.36 U	0.38 U	0.34 U	0.35 U
VANADIUM	55.7	53.9	26.7	3.8	48.4	19.7	18.3	12.3	17.6	16.5
ZINC	77.6	1010	93.5	10.8	67.6	136	28.3	15.1 J	9.5 J	38.4 J
Radionuclides (PCI/G)										
GROSS ALPHA	5.9	7.2	14	5.4	11	4.2	5.3	7.3	9.5	3.9 U
GROSS BETA	5.1 U	9.4	17	8.3	10	0.19 U	16	26	20	7.9
Miscellaneous Parameters										
PH (S.U.)	6.74	6.6	4.43	4.4	5.04	6.92	6.75			
TOXAPHENE (ug/kg)								210 U	190 U	990 U

SEDIMENT

SUMMARY OF ANALYTICAL RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - POST REMOVAL ANALYTICAL RESULTS
FORMER NSWC WHITE OAK

LOCATION	0003-SD-01	0003-SD-02	0003-SD-03	0003-SD-04	0003-SD-05	0003-SD-05
NSAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
SAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
MATRIX	SD	SD	SD	SD	SD	SD
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC TYPE	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000
VALIDATED	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)						
1,1,1-TRICHLOROETHANE	15 U	14 U	16 U	12 U	15 U	15 U
1,1,2,2-TETRACHLOROETHANE	15 U	14 U	16 U	12 U	15 U	15 U
1,1,2-TRICHLOROETHANE	15 U	14 U	16 U	12 U	15 U	15 U
1,1-DICHLOROETHANE	15 U	14 U	16 U	12 U	15 U	15 U
1,1-DICHLOROETHENE	15 U	14 U	16 U	12 U	15 U	15 U
1,2-DICHLOROETHANE	15 U	14 U	16 U	12 U	15 U	15 U
1,2-DICHLOROPROPANE	15 U	14 U	16 U	12 U	15 U	15 U
2-BUTANONE	15 U	14 U	16 U	12 U	15 U	15 U
2-HEXANONE	15 U	14 U	16 U	12 U	15 U	15 U
4-METHYL-2-PENTANONE	15 U	14 U	16 U	12 U	15 U	15 U
ACETONE	15 U	14 U	16 U	12 U	15 U	15 U
BENZENE	15 U	14 U	16 U	12 U	15 U	15 U
BROMODICHLOROMETHANE	15 U	14 U	16 U	12 U	15 U	15 U
BROMOFORM	15 U	14 U	16 U	12 U	15 U	15 U
BROMOMETHANE	15 U	14 U	16 U	12 U	15 U	15 U
CARBON DISULFIDE	15 U	14 U	16 U	12 U	15 U	15 U
CARBON TETRACHLORIDE	15 U	14 U	16 U	12 U	15 U	15 U
CHLOROBENZENE	15 U	14 U	16 U	12 U	15 U	15 U
CHLORODIBROMOMETHANE	15 U	14 U	16 U	12 U	15 U	15 U
CHLOROETHANE	15 U	14 U	16 U	12 U	15 U	15 U
CHLOROFORM	15 U	14 U	16 U	12 U	15 U	15 U
CHLOROMETHANE	15 U	14 U	16 U	12 U	15 U	15 U
CIS-1,3-DICHLOROPROPENE	15 U	14 U	16 U	12 U	15 U	15 U
ETHYLBENZENE	15 U	14 U	16 U	12 U	15 U	15 U
METHYLENE CHLORIDE	1 B	2 B	16 U	12 U	2 B	2 B
STYRENE	15 U	14 U	16 U	12 U	15 U	15 U
TETRACHLOROETHENE	15 U	14 U	16 U	12 U	15 U	15 U
TOLUENE	15 U	14 U	16 U	12 U	15 U	15 U
TOTAL 1,2-DICHLOROETHENE	15 U	14 U	16 U	12 U	15 U	15 U
TOTAL XYLENES	15 U	14 U	16 U	12 U	15 U	15 U
TRANS-1,3-DICHLOROPROPENE	15 U	14 U	16 U	12 U	15 U	15 U
TRICHLOROETHENE	15 U	14 U	16 U	12 U	15 U	15 U
VINYL CHLORIDE	15 U	14 U	16 U	12 U	15 U	15 U
Semivolatile Organics (ug/kg)						
1,2,4-TRICHLOROBENZENE	210 J	890 U	1100 U	780 U	980 U	980 U
1,2-DICHLOROBENZENE	1000 U	890 U	1100 U	780 U	980 U	980 U
1,3-DICHLOROBENZENE	1000 U	890 U	1100 U	780 U	980 U	980 U

SUMMARY OF ANALYTICAL RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - POST REMOVAL ANALYTICAL RESULTS
FORMER NSWC WHITE OAK

LOCATION	0003-SD-01	0003-SD-02	0003-SD-03	0003-SD-04	0003-SD-05	0003-SD-05
NSAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
SAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
MATRIX	SD	SD	SD	SD	SD	SD
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC TYPE	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000
VALIDATED	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
1,4-DICHLOROBENZENE	1000 U	890 U	1100 U	780 U	980 U	980 U
2,2'-OXYBIS(1-CHLOROPROPANE)	1000 U	890 U	1100 U	780 U	980 U	980 U
2,4,5-TRICHLOROPHENOL	2600 U	2200 U	2700 U	2000 U	2500 U	2500 U
2,4,6-TRICHLOROPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
2,4-DICHLOROPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
2,4-DIMETHYLPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
2,4-DINITROPHENOL	2600 U	2200 U	2700 U	2000 U	2500 UJ	2500 UJ
2,4-DINITROTOLUENE	1000 U	890 U	1100 U	780 U	980 U	980 U
2,6-DINITROTOLUENE	1000 U	890 U	1100 U	780 U	980 U	980 U
2-CHLORONAPHTHALENE	1000 U	890 U	1100 U	780 U	980 U	980 U
2-CHLOROPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
2-METHYLNAPHTHALENE	1000 U	890 U	1100 U	780 U	980 U	980 U
2-METHYLPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
2-NITROANILINE	2600 U	2200 U	2700 U	2000 U	2500 U	2500 U
2-NITROPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
3,3'-DICHLOROBENZIDINE	1000 U	890 U	1100 U	780 U	980 U	980 U
3-NITROANILINE	2600 U	2200 U	2700 U	2000 U	2500 U	2500 U
4,6-DINITRO-2-METHYLPHENOL	2600 U	2200 U	2700 U	2000 U	2500 UJ	2500 UJ
4-BROMOPHENYL PHENYL ETHER	1000 U	890 U	1100 U	780 U	980 U	980 U
4-CHLORO-3-METHYLPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
4-CHLOROANILINE	2100 U	1800 U	2200 U	1600 U	2000 U	2000 U
4-CHLOROPHENYL PHENYL ETHER	1000 U	890 U	1100 U	780 U	980 U	980 U
4-METHYLPHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
4-NITROANILINE	2600 U	2200 U	2700 U	2000 U	2500 U	2500 U
4-NITROPHENOL	2600 U	2200 U	2700 U	2000 U	2500 U	2500 U
ACENAPHTHENE	1000 U	280 J	160 J	780 U	980 U	980 U
ACENAPHTHYLENE	1000 U	890 U	1100 U	780 U	980 U	980 U
ANTHRACENE	1000 U	680 J	370 J	780 U	980 U	980 U
BENZO(A)ANTHRACENE	160 J	1300	890 J	780 U	980 U	980 U
BENZO(A)PYRENE	200 J	1200	970 J	780 U	980 U	980 U
BENZO(B)FLUORANTHENE	270 J	1700	1300	780 U	980 U	980 U
BENZO(G,H,I)PERYLENE	1000 U	430 J	340 J	780 U	980 U	980 U
BENZO(K)FLUORANTHENE	1000 U	580 J	430 J	780 U	980 U	980 U
BIS(2-CHLOROETHOXY)METHANE	1000 U	890 U	1100 U	780 U	980 U	980 U
BIS(2-CHLOROETHYL)ETHER	1000 U	890 U	1100 U	780 U	980 U	980 U
BIS(2-ETHYLHEXYL)PHTHALATE	210 J	140 J	250 J	780 U	980 U	980 U
BUTYL BENZYL PHTHALATE	1000 U	890 U	1100 U	780 U	980 U	980 U
CARBAZOLE	2200 U	2000 U	2400 U	1700 U	2200 U	2200 U

SUMMARY OF ANALYTICAL RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - POST REMOVAL ANALYTICAL RESULTS
FORMER NSWC WHITE OAK

LOCATION	0003-SD-01	0003-SD-02	0003-SD-03	0003-SD-04	0003-SD-05	0003-SD-05
NSAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
SAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
MATRIX	SD	SD	SD	SD	SD	SD
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC TYPE	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000
VALIDATED	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
CHRYSENE	180 J	1100	820 J	780 U	980 U	980 U
DI-N-BUTYL PHTHALATE	1000 U	890 U	1100 U	780 U	980 U	980 U
DI-N-OCTYL PHTHALATE	1000 U	890 U	1100 U	780 U	980 U	980 U
DIBENZO(A,H)ANTHRACENE	1000 U	130 J	1100 U	780 U	980 U	980 U
DIBENZOFURAN	1000 U	150 J	1100 U	780 U	980 U	980 U
DIETHYL PHTHALATE	1000 U	890 U	1100 U	780 U	980 U	980 U
DIMETHYL PHTHALATE	1000 U	890 U	1100 U	780 U	980 U	980 U
FLUORANTHENE	320 J	2600	1700	780 U	980 U	980 U
FLUORENE	1000 U	340 J	220 J	780 U	980 U	980 U
HEXACHLOROBENZENE	1000 U	890 U	1100 U	780 U	980 U	980 U
HEXACHLOROBUTADIENE	1000 U	890 U	1100 U	780 U	980 U	980 U
HEXACHLOROCYCLOPENTADIENE	1400 U	1200 U	1500 U	1100 U	1300 U	1300 U
HEXACHLOROETHANE	1000 U	890 U	1100 U	780 U	980 U	980 U
INDENO(1,2,3-CD)PYRENE	1000 U	410 J	320 J	780 U	980 U	980 U
ISOPHORONE	1000 U	890 U	1100 U	780 U	980 U	980 U
N-NITROSO-DI-N-PROPYLAMINE	1000 U	890 U	1100 U	780 U	980 U	980 U
N-NITROSODIPHENYLAMINE	1300 U	1100 U	1400 U	990 U	1200 U	1200 U
NAPHTHALENE	1000 U	110 J	1100 U	780 U	980 U	980 U
NITROBENZENE	1000 U	890 U	1100 U	780 U	980 U	980 U
PENTACHLOROPHENOL	2600 U	2200 U	2700 U	2000 U	2500 U	2500 U
PHENANTHRENE	180 J	2400	1300	780 U	980 U	980 U
PHENOL	1000 U	890 U	1100 U	780 U	980 U	980 U
PYRENE	320 J	2200	1500	780 U	980 U	980 U
Energetics (ug/kg)						
1,3,5-TRINITROBENZENE	310 U	270 U	330 U	240 U	300 U	300 U
1,3-DINITROBENZENE	310 U	270 U	330 U	240 U	300 U	300 U
2,4,6-TRINITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
2,4-DINITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
2,6-DINITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
2-AMINO-4,6-DINITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
2-NITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
3-NITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
4-AMINO-2,6-DINITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
4-NITROTOLUENE	310 U	270 U	330 U	240 U	300 U	300 U
HMX	310 U	270 U	330 U	240 U	300 U	300 U
NITROBENZENE	310 U	270 U	330 U	240 U	300 U	300 U
RDX	310 U	270 U	330 U	240 U	300 U	300 U
TETRYL	310 U	270 U	330 U	240 U	300 U	300 U

SUMMARY OF ANALYTICAL RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - POST REMOVAL ANALYTICAL RESULTS
FORMER NSWC WHITE OAK

LOCATION	0003-SD-01	0003-SD-02	0003-SD-03	0003-SD-04	0003-SD-05	0003-SD-05
NSAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
SAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
MATRIX	SD	SD	SD	SD	SD	SD
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC TYPE	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000
VALIDATED	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Pesticides/PCB's (ug/kg)						
4,4'-DDD	270 K	220 U	540 U	39 U	4.9 U	4.9 U
4,4'-DDE	250 U	220 U	540 U	39 U	4.9 U	4.9 U
4,4'-DDT	2600 J	1600 J	5300 K	290 J	1.8 J	4.9 U
ALDRIN	130 U	110 U	280 U	20 U	2.5 U	2.5 U
ALPHA-BHC	130 U	110 U	280 U	20 U	2.5 U	2.5 U
ALPHA-CHLORDANE	240 K	110 U	280 U	20 U	1.8 J	3
AROCLOR-1016	2500 U	2200 U	5400 U	390 U	49 U	49 U
AROCLOR-1221	5200 U	4500 U	11000 U	790 U	99 U	99 U
AROCLOR-1232	2500 U	2200 U	5400 U	390 U	49 U	49 U
AROCLOR-1242	2500 U	2200 U	5400 U	390 U	49 U	49 U
AROCLOR-1248	2500 U	2200 U	5400 U	390 U	49 U	49 U
AROCLOR-1254	2500 U	14000	40000 K	2300	49 U	59
AROCLOR-1260	17000 K	2200 U	5400 U	390 U	49 U	49 U
BETA-BHC	130 U	110 U	280 U	20 U	2.5 U	2.5 U
DELTA-BHC	130 U	110 U	280 U	20 U	2.5 U	2.5 U
DIELDRIN	250 U	220 U	540 U	39 U	4.9 U	4.9 U
ENDOSULFAN I	130 U	110 U	280 U	20 U	2.5 U	2.5 U
ENDOSULFAN II	250 U	220 U	540 U	39 U	4.9 U	4.9 U
ENDOSULFAN SULFATE	250 U	220 U	540 U	39 U	4.9 U	4.9 U
ENDRIN	250 U	220 U	540 U	39 U	4.9 U	4.9 U
ENDRIN ALDEHYDE	250 U	220 U	540 U	39 U	4.9 U	4.9 U
ENDRIN KETONE	250 U	220 U	540 U	39 U	4.9 U	4.9 U
GAMMA-BHC (LINDANE)	130 U	110 U	280 U	20 U	2.5 U	2.5 U
GAMMA-CHLORDANE	190 R	110 U	280 U	20 U	1.1 J	2.4 J
HEPTACHLOR	130 U	110 U	280 U	20 U	2.5 U	2.5 U
HEPTACHLOR EPOXIDE	130 U	110 U	280 U	20 U	2.5 U	2.5 U
METHOXYCHLOR	1300 U	1100 U	2800 U	200 U	25 U	25 U
TOXAPHENE	13000 U	11000 U	28000 U	2000 U	250 U	250 U
Inorganics (mg/kg)						
ALUMINUM	16500	9240	17400	2270	5410	4980
ANTIMONY	1.4 B	2.2 B	3.3 B	0.73 U	0.92 U	0.92 U
ARSENIC	6.8	3.7 B	6.4 K	2.5 B	2.4 B	2.6 B
BARIUM	153	162	276	77.9 K	34 K	31.2 K
BERYLLIUM	0.09 U	0.08 U	0.1 U	0.07 U	0.09 U	0.09 U
CADMIUM	1.8	5.9	8.8	0.94	0.14 U	0.15 U
CALCIUM	1840 K	1730 K	3260	196 K	1500 K	3630
CHROMIUM	30.4	23.2	43.9	8.7	11.7	11

SUMMARY OF ANALYTICAL RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - POST REMOVAL ANALYTICAL RESULTS
FORMER NSWC WHITE OAK

LOCATION	0003-SD-01	0003-SD-02	0003-SD-03	0003-SD-04	0003-SD-05	0003-SD-05
NSAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
SAMPLE	003-SD-01	003-SD-02	003-SD-03	003-SD-04	003-SD-05	003-SD-06
MATRIX	SD	SD	SD	SD	SD	SD
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
QC TYPE	NM	NM	NM	NM	NM	NM
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000
VALIDATED	Y	Y	Y	Y	Y	Y
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
COBALT	8.7	7.4	15.5	3.6	5.2	4.8
COPPER	147	170	370	38.6	8.2 B	7.7 B
IRON	24200	15500	29300	8450	10300	8550
LEAD	96.6	110	211	39.1	6.6	5.4
MAGNESIUM	1470	1410	2520	2100	1240	1220
MANGANESE	429	352	1000	289	178	265
MERCURY	1.8	3.2	4.5	0.86	0.07	0.04 B
NICKEL	27.7	36.9	68.6	15.2	12.4	12.6
POTASSIUM	646 L	562 L	909 L	153 L	383 L	380 L
SELENIUM	2.9 K	1.8 K	3.1 K	1 K	1.1 K	1.4 K
SILVER	9.1 K	10.2 K	19.5 K	12.3 K	0.18 U	0.18 U
SODIUM	53.3 U	46.7 U	56.2 U	40.8 U	51.2 U	51.3 U
THALLIUM	0.46 U	0.41 U	0.49 U	0.35 U	0.44 U	0.44 U
VANADIUM	54.2	43.9	77.5	7.9	13.4	11.1
ZINC	341	401	871	107	45.6	52.2
Radionuclides (PCI/G)						
GROSS ALPHA	8.7	7.1	12	3 U	6.9	2.1 U
GROSS BETA	14	6.5	2.7 U	-3.7 U	3.2 U	-0.19 U
Miscellaneous Parameters						
CYANIDE (mg/kg)	3.9 U	3.4 U	4.1 U	2.9 U	3.7 U	3.7 U
PH (S.U.)	7.83 J	8.07 J	7.93 J	7.63 J	7.95 J	7.91 J

SUMMARY OF ANALYTICAL RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

Sediment Samples collected April, 2002

	Silver mg/kg		Mercury mg/kg		PCB-1254 mg/kg		PCB-1260 mg/kg	
03SD0010006	0.083		0.04		0.031	J	0.015	
03SD0020006	14.8		6.2		10		8.8	
03SD0030006	0.026		0.02		1.1		0.039	U
03SD0040006	0.12		0.036		0.096		0.033	J
03SD0050006	0.085		0.044		7.5		0.41	U
03SD0060006	0.077		0.53		0.31		0.042	U
03SD0070006	0.095		0.11		0.13		0.042	U
03SD0080006	0.081		0.027		0.089		0.039	U
03SD0090006	0.097		0.02	U	0.19		0.04	U
03SD0010006	0.095		0.043		0.34		0.042	U
03SD0011006	0.093		0.028		2.3		0.21	U
03SD0012006	NA		NA		0.065		0.04	U
03SD002FD0006	10.6		3.8		0.66		0.047	U

SUMMARY OF POSITIVE DETECTIONS

SOIL

SUMMARY OF POSITIVE RESULTS - POST-REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

	003-SS-01 8/28/2000	003-SS-02 8/28/2000	003-SS-03 8/28/2000	003-SS-04 8/28/2000	003-SS-05 8/28/2000	003-SS-06 8/28/2000	003-SS-07 8/28/2000
Inorganics (mg/kg)							
Aluminum	11000	15700	10300	1820	20100	7340	11900
Antimony	14 U	0.9 J	13.5 J	14.4 U	15.1 U	1.1 J	14.4 U
Arsenic	2.4	3.4	3.5	0.7 J	4	2.1 J	1.3 J
Barium	51.5	101	38.7 J	14 J	50.5	48.9	77.1
Beryllium	1.2 U	1.2 U	1.2 U	1.2 U	1.3 U	1.2 U	1.2 U
Cadmium	0.38 J	2.3	0.21 J	1.2 U	0.49 J	0.7 J	1.2 U
Calcium	1100 J	1990	1160 J	265 J	1350	4200	607 J
Chromium, total	34.5	25.2	24.4	8.3	29.3	14.8	14.7
Cobalt	4.8 J	10 J	6.2 J	1.5 J	3.6 J	3.8 J	5.2 J
Copper	47.3	104	437	2.3 J	35.3	45.6	7.4
Iron	17700	22200	18200	3700	23800	11100	12100
Lead	19.6	76.8	29	1.9	20.2	29	10.2
Magnesium	813 J	2830	575 J	342 J	803 J	954 J	910 J
Manganese	94.4	293	260	14.3	96.2	156	103
Mercury	0.76	3.8	0.58	0.54	1.4	1.3	0.42
Molybdenum	1.4	2	2.1	0.44 J	0.83 J	1.4	0.96 U
Nickel	12.7	38.7	9.9 J	2.3 J	7.3 J	11.7	5.7 J
Potassium	416 J	856 J	288 J	192 J	463 J	258 J	578 J
Selenium	2	1.3	2	1.2 U	1.3 U	2.6	1.2 U
Silver	6.6	3.8	2.2 J	2.4 U	0.38 J	147	2.4 U
Sodium	1170 U	393 J	1250 U	1200 U	1260 U	1190 U	1200 U
Thallium	2.3 U	2.4 U	2.5 U	2.4 U	2.5 U	2.4 U	2.4 U
Vanadium	55.7	53.9	26.7	3.8 J	48.4	19.7	18.3
Zinc	77.6	1010	93.5	10.8	67.6	136	28.3
Volatile Organics (mg/kg)							
Acetone	0.012 U	0.012 U	0.012 U	0.006 J	0.013 U	0.012 U	0.012 U
Chlorobenzene	0.012 U	0.004 J	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U
1,2-Dichloroethene (total)	0.012 U	0.015	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U
Methyl Ethyl Ketone	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U
2-Hexanone	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U
4-Methyl-2-Pentanone	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U
Methylene Chloride	0.002 J	0.002 J	0.002 J	0.001 J	0.001 J	0.002 J	0.002 J
Trichloroethene	0.001 J	0.025	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U

SUMMARY OF POSITIVE RESULTS - POST-REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

	003-SS-01 8/28/2000	003-SS-02 8/28/2000	003-SS-03 8/28/2000	003-SS-04 8/28/2000	003-SS-05 8/28/2000	003-SS-06 8/28/2000	003-SS-07 8/28/2000
Semivolatile Organics (mg/kg)							
Acenaphthene	0.71 J	0.8 U	0.41 U	0.4 U	0.83 U	0.78 U	0.4 U
Anthracene	2.8	0.21 J	0.042 J	0.4 U	0.11 J	0.78 U	0.4 U
Benz(a)anthracene	2.4	0.51 J	0.12 J	0.4 U	0.83 U	0.12 J	0.097 J
Benzo(a)pyrene	1.8	0.44 J	0.1 J	0.4 U	0.83 U	0.13 J	0.075 J
Benzo(b)fluoranthene	2.3	0.65 J	0.22 J	0.4 U	0.83 U	0.15 J	0.11 J
Benzo(g,h,i)perylene	0.76 J	0.16 J	0.41 U	0.4 U	0.83 U	0.78 U	0.4 U
Benzo(k)fluoranthene	1.1 J	0.17 J	0.41 U	0.4 U	0.83 U	0.78 U	0.041 J
Bis(2-ethylhexyl)phthalate	1.5 U	1.8	0.12 J	0.4 U	0.83 U	0.78 U	0.4 U
Carbazole	0.8 J	1.8 U	0.91 U	0.88 U	1.8 U	1.7 U	0.88 U
Chrysene	2.4	0.49 J	0.13 J	0.4 U	0.83 U	0.14 J	0.1 J
Di-n-butylphthalate	1.5 U	0.14 J	0.054 J	0.4 U	0.83 U	0.78 U	0.4 U
Dibenz(a,h)anthracene	0.22 J	0.8 U	0.41 U	0.4 U	0.83 U	0.78 U	0.4 U
Dibenzofuran	0.41 J	0.8 U	0.41 U	0.4 U	0.83 U	0.78 U	0.4 U
Fluoranthene	8.2	1	0.25 J	0.4 U	0.83 U	0.23 J	0.18 J
Fluorene	1.1 J	0.8 U	0.41 U	0.4 U	0.83 U	0.78 U	0.4 U
Indeno (1,2, 3-cd)pyrene	0.77 J	0.15 J	0.41 U	0.4 U	0.83 U	0.78 U	0.4 U
Naphthalene	0.28 J	0.8 U	0.41 U	0.4 U	0.83 U	0.78 U	0.4 U
Phenanthrene	7.6	0.47 J	0.12 J	0.4 U	0.11 J	0.15 J	0.05 J
Pyrene	5.4	0.98	0.29 J	0.4 U	0.085 J	0.25 J	0.15 J
1,2,4-Trichlorobenzene	0.34 J	0.8 U	0.21 J	0.072 J	0.83 U	0.78 U	0.34 J
Pesticides/Pcbs (mg/kg)							
alpha-Chlordane							
gamma-Chlordane	0.04 U	0.041 U	0.073	0.0041 U	0.021 U	0.02 U	0.02 U
4,4'-DDD	0.065 J	0.073 J	0.021 J	0.02	0.014 J	0.078	0.054
4,4'-DDE	0.032 J	0.08 U	0.041 U	0.0039 J	0.017 J	0.039 U	0.02 J
4,4'-DDT	0.62	0.71	0.21	0.08	0.19	0.27	0.29
Aroclor-1260	4.9	4.2	1.6	0.58	1.4	1.5	2

Explosives (ug/kg) - None Detected

SUMMARY OF POSITIVE RESULTS - POST-REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

	003-SS-08 8/16/2000	003-SS-09 8/16/2000	003-SS-10 8/16/2000
Inorganics (mg/kg)			
Aluminum	5380	6390	8290
Antimony	15 U	13.6 U	0.93 J
Arsenic	1.6 J	2.2 J	2.1 J
Barium	33.2 J	26.3 J	45.3 J
Beryllium	1.3 U	1.1 U	0.14 J
Cadmium	1.3 U	1.1 U	0.21 J
Calcium	209 J	206 J	534 J
Chromium, total	8	10.8	11.1
Cobalt	9.8 J	4.3 J	3 J
Copper	23.8	13.4	15.3
Iron	13400	17100	9030
Lead	12.1	13.6	14.2
Magnesium	297 J	295 J	598 J
Manganese	279	81.6	50.5
Mercury	0.097 J	0.13	0.18
Molybdenum	1 U	0.91 U	0.44 J
Nickel	2.4 J	2.3 J	6.5 J
Potassium	182 J	163 J	212 J
Selenium	1.3 U	1.1 U	0.7 J
Silver	2.5 U	2.3 U	0.27 J
Sodium	1250 U	1130 U	1170 U
Thallium	2.5 U	2.3 U	2.3 U
Vanadium	12.3 J	17.6	16.5
Zinc	15.1	9.5	38.4
Volatile Organics (mg/kg)			
Acetone	0.005 J	0.005 J	0.005 J
Chlorobenzene	0.013 U	0.011 U	0.012 U
1,2-Dichloroethene (total)	0.013 U	0.011 U	0.012 U
Methyl Ethyl Ketone	0.005 J	0.005 J	0.006 J
2-Hexanone	0.0006 J	0.011 U	0.0007 J
4-Methyl-2-Pentanone	0.013 U	0.0008 J	0.012 U
Methylene Chloride	0.013 U	0.011 U	0.012 U
Trichloroethene	0.013 U	0.011 U	0.012 U

SUMMARY OF POSITIVE RESULTS - POST-REMOVAL SOIL
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

	003-SS-08 8/16/2000	003-SS-09 8/16/2000	003-SS-10 8/16/2000
Semivolatile Organics (mg/k			
Acenaphthene	0.41 U	0.37 U	0.38 U
Anthracene	0.41 U	0.37 U	0.38 U
Benz(a)anthracene	0.41 U	0.37 U	0.38 U
Benzo(a)pyrene	0.41 U	0.37 U	0.38 U
Benzo(b)fluoranthene	0.41 U	0.37 U	0.38 U
Benzo(g,h,i)perylene	0.41 U	0.37 U	0.38 U
Benzo(k)fluoranthene	0.41 U	0.37 U	0.38 U
Bis(2-ethylhexyl)phthalate	0.41 U	0.37 U	0.38 U
Carbazole	0.41 U	0.37 U	0.38 U
Chrysene	0.41 U	0.37 U	0.38 U
Di-n-butylphthalate	0.41 U	0.37 U	0.38 U
Dibenz(a,h)anthracene	0.41 U	0.37 U	0.38 U
Dibenzofuran	0.41 U	0.37 U	0.38 U
Fluoranthene	0.41 U	0.37 U	0.38 U
Fluorene	0.41 U	0.37 U	0.38 U
Indeno (1,2, 3-cd)pyrene	0.41 U	0.37 U	0.38 U
Naphthalene	0.41 U	0.37 U	0.38 U
Phenanthrene	0.41 U	0.37 U	0.38 U
Pyrene	0.41 U	0.37 U	0.38 U
1,2,4-Trichlorobenzene	0.41 U	0.37 U	0.38 U
Pesticides/Pcbs (mg/kg)			
alpha-Chlordane			
gamma-Chlordane	0.0021 U	0.0019 U	0.0099 U
4,4'-DDD	0.023	0.016	0.023
4,4'-DDE	0.0018 J	0.0012 J	0.011 J
4,4'-DDT	0.058	0.023	0.15
Aroclor-1260	0.057	0.065	0.61

SEDIMENT

SUMMARY OF POSITIVE RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

	0003-SD-01 11/2/2000	0003-SD-02 11/2/2000	0003-SD-03 11/2/2000	0003-SD-04 11/2/2000	0003-SD-05 11/2/2000	0003-SD-06 11/2/2000
CLP Metals (mg/kg)						
Aluminum	16500	9240	17400	2270	5410	4980
Antimony	1.4 J	2.2 J	3.3 J	14.2 U	17.7 U	17.8 U
Arsenic	6.8	3.7	6.4	2.5	2.4 J	2.6 J
Barium	153	162	276	77.9	34 J	31.2 J
Beryllium	1.5 U	1.4 U	1.6 U	1.2 U	1.5 U	1.5 U
Cadmium	1.8	5.9	8.8	0.94 J	1.5 U	1.5 U
Calcium	1840	1730	3260	196 J	1500	3630
Chromium, total	30.4	23.2	43.9	8.7	11.7	11
Cobalt	8.7 J	7.4 J	15.5 J	3.6 J	5.2 J	4.8 J
Copper	147	170	370	38.6	8.2	7.7
Iron	24200	15500	29300	8450	10300	8550
Lead	96.6	110	211	39.1	6.6	5.4
Magnesium	1470 J	1410	2520	2100	1240 J	1220 J
Manganese	429	352	1000	289	178	265
Molybdenum	2.6	3.2	6.5	2.1	0.77 J	0.84 J
Nickel	27.7	36.9	68.6	15.2	12.4	12.5
Potassium	646 J	562 J	909 J	153 J	383 J	380 J
Selenium	2.9	1.8	3.1	1 J	1.1 J	1.4 J
Sodium	1540 U	1350 U	1630 U	1180 U	1480 U	1480 U
Thallium	3.1 U	2.7 U	3.3 U	2.4 U	3 U	3 U
Vanadium	54.2	43.9	77.5	7.9 J	13.4 J	11.1 J
Zinc	341	401	871	107	45.6	52.2
Volatile Organics (mg/kg)						
Acetone	0.015 U	0.014 U	0.016 U	0.012 U	0.015 U	0.015 U
Chlorobenzene	0.015 U	0.014 U	0.016 U	0.012 U	0.015 U	0.015 U
1,2-Dichloroethene (total)	0.015 U	0.014 U	0.016 U	0.012 U	0.015 U	0.015 U
Methyl Ethyl Ketone	0.015 U	0.014 U	0.016 U	0.012 U	0.015 U	0.015 U
2-Hexanone	0.015 U	0.014 U	0.016 U	0.012 U	0.015 U	0.015 U
4-Mehtyl-2-Pentanone	0.015 U	0.014 U	0.016 U	0.012 U	0.015 U	0.015 U
Methylene Chloride	0.001 J	0.002 J	0.016 U	0.012 U	0.002 J	0.002 J
Trichloroethene	0.015 U	0.014 U	0.016 U	0.012 U	0.015 U	0.015 U

SUMMARY OF POSITIVE RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

Semivolatile Organics (mg/kg)						
Acenaphthene	1 U	0.28 J	0.16 J	0.78 U	0.98 U	0.98 U
Anthracene	1 U	0.68 J	0.37 J	0.78 U	0.98 U	0.98 U
Benz(a)anthracene	0.16 J	1.3	0.89 J	0.78 U	0.98 U	0.98 U
Benzo(a)pyrene	0.2 J	1.2	0.97 J	0.78 U	0.98 U	0.98 U
Benzo(b)fluoranthene	0.27 J	1.7	1.3	0.78 U	0.98 U	0.98 U
Benzo(g,h,i)perylene	1 U	0.43 J	0.34 J	0.78 U	0.98 U	0.98 U
Benzo(k)fluoranthene	1 U	0.58 J	0.43 J	0.78 U	0.98 U	0.98 U
Bis(2-ethylhexyl)phthalate	0.21 J	0.14 J	0.25 J	0.78 U	0.98 U	0.98 U
Carbazole	2.2 U	2 U	2.4 U	1.7 U	2.2 U	2.2 U
Chrysene	0.18 J	1.1	0.82 J	0.78 U	0.98 U	0.98 U
Di-b-butylphthalate	1 U	0.8 U	1.1 U	0.78 U	0.98 U	0.98 U
Dibenz(a,h)anthracene	1 U	0.13 J	1.1 U	0.78 U	0.98 U	0.98 U
Dibenzofuran	1 U	0.15 J	1.1 U	0.78 U	0.98 U	0.98 U
Fluoranthene	0.32 J	2.6	1.7	0.78 U	0.98 U	0.98 U
Fluorene	1 U	0.34 J	0.22 J	0.78 U	0.98 U	0.98 U
Indeno (1,2, 3-cd)pyrene	1 U	0.41 J	0.32 J	0.78 U	0.98 U	0.98 U
Naphthalene	1 U	0.11 J	1.1 U	0.78 U	0.98 U	0.98 U
Phenanthrene	0.18 J	2.4	1.3	0.78 U	0.98 U	0.98 U
Pyrene	0.32 J	2.2	1.5	0.78 U	0.98 U	0.98 U
1,2,4-Trichlorobenzene	0.21 J	0.89 U	1.1 U	0.78 U	0.98 U	0.98 U
Pesticides/Pcbs (mg/kg)						
alpha-Chlordane	0.24	0.11 U	0.28 U	0.02 U	0.0018 J	0.003
gamma-Chlordane	0.19	0.11 U	0.28 U	0.02 U	0.0011 J	0.0024 J
4,4'-DDD	0.27	0.22 U	0.54 U	0.039 U	0.0049 U	0.0049 U
4,4'-DDE	0.25 U	0.22 U	0.54 U	0.039 U	0.0049 U	0.0049 U
4,4'-DDT	2.6	1.6	5.3	0.29	0.0018 J	0.0049 U

SUMMARY OF POSITIVE RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

Sediment Samples collected April, 2002

	Silver mg/kg		Mercury mg/kg		PCB-1254 mg/kg		PCB-1260 mg/kg	
03SD0010006	0.083		0.04		0.031	J	0.015	
03SD0020006	14.8		6.2		10		8.8	
03SD0030006	0.026		0.02		1.1		0.039	U
03SD0040006	0.12		0.036		0.096		0.033	J
03SD0050006	0.085		0.044		7.5		0.41	U
03SD0060006	0.077		0.53		0.31		0.042	U
03SD0070006	0.095		0.11		0.13		0.042	U
03SD0080006	0.081		0.027		0.089		0.039	U
03SD0090006	0.097		0.02	U	0.19		0.04	U
03SD0010006	0.095		0.043		0.34		0.042	U
03SD0011006	0.093		0.028		2.3		0.21	U
03SD0012006	NA		NA		0.065		0.04	U
03SD002FD0006	10.6		3.8		0.66		0.047	U

SUMMARY OF ANALYTCAL RESULTS - POST-REMOVAL SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

Sediment Samples collected April, 2002

	Silver mg/kg		Mercury mg/kg		PCB-1254 mg/kg		PCB-1260 mg/kg	
03SD0010006	0.083		0.04		0.031	J	0.015	
03SD0020006	14.8		6.2		10		8.8	
03SD0030006	0.026		0.02		1.1		0.039	U
03SD0040006	0.12		0.036		0.096		0.033	J
03SD0050006	0.085		0.044		7.5		0.41	U
03SD0060006	0.077		0.53		0.31		0.042	U
03SD0070006	0.095		0.11		0.13		0.042	U
03SD0080006	0.081		0.027		0.089		0.039	U
03SD0090006	0.097		0.02	U	0.19		0.04	U
03SD0010006	0.095		0.043		0.34		0.042	U
03SD0011006	0.093		0.028		2.3		0.21	U
03SD0012006	NA		NA		0.065		0.04	U
03SD002FD0006	10.6		3.8		0.66		0.047	U

RESULTS OF WILCOXON RANK SUM TEST
FOR
COMPARISON TO BACKGROUND

SOIL BACKGROUND STATISTICS - RESULTS OF WILCOXON RANK SUM TEST
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

METAL	Rank Sum SITE	Rank Sum BACK	U	Z	p-level	Z adjusted	p-level	Valid N SITE	Valid N BACK	SITE ABOVE BACKGROUND
ALUMINUM	125.0	340.0	70	-1.320	0.187	-1.320	0.187	10	20	NO
ANTIMONY	**255.0**	**210.0**	**0**	**4.399**	**0.000**	**4.412**	**0.000**	**10**	**20**	**YES**
ARSENIC	109.5	355.5	55	-2.002	0.045	-2.003	0.045	10	20	NO
BARIUM	164.5	300.5	91	0.418	0.676	0.418	0.676	10	20	NO
BERYLLIUM	**243.0**	**222.0**	**12**	**3.871**	**0.000**	**3.962**	**0.000**	**10**	**20**	**YES**
CADMIUM	**249.0**	**216.0**	**6**	**4.135**	**0.000**	**4.155**	**0.000**	**10**	**20**	**YES**
CALCIUM	**235.0**	**230.0**	**20**	**3.520**	**0.000**	**3.520**	**0.000**	**10**	**20**	**YES**
CHROMIUM,TOTAL	130.0	335.0	75	-1.100	0.271	-1.100	0.271	10	20	NO
COBALT	163.5	301.5	92	0.374	0.708	0.374	0.708	10	20	NO
COPPER	**209.0**	**256.0**	**46**	**2.376**	**0.018**	**2.376**	**0.017**	**10**	**20**	**YES**
IRON	136.0	329.0	81	-0.836	0.403	-0.836	0.403	10	20	NO
LEAD	160.0	305.0	95	0.220	0.826	0.220	0.826	10	20	NO
MAGNESIUM	142.0	323.0	87	-0.572	0.567	-0.572	0.567	10	20	NO
MANGANESE	164.0	301.0	91	0.396	0.692	0.396	0.692	10	20	NO
MERCURY	**248.5**	**216.5**	**7**	**4.113**	**0.000**	**4.129**	**0.000**	**10**	**20**	**YES**
MOLYBDENUM	--	--	0	0.000	1.000	0.000	0.000	10	0	NO
NICKEL	155.0	310.0	100	0.000	1.000	0.000	1.000	10	20	NO
POTASSIUM	111.0	354.0	56	-1.936	0.053	-1.936	0.053	10	20	NO
SELENIUM	**206.0**	**259.0**	**49**	**2.244**	**0.025**	**2.247**	**0.025**	**10**	**20**	**YES**
SILVER	**247.0**	**218.0**	**8**	**4.047**	**0.000**	**4.091**	**0.000**	**10**	**20**	**YES**
SODIUM	**255.0**	**210.0**	**0**	**4.399**	**0.000**	**4.401**	**0.000**	**10**	**20**	**YES**
THALLIUM	**255.0**	**210.0**	**0**	**4.399**	**0.000**	**4.418**	**0.000**	**10**	**20**	**YES**
VANADIUM	128.0	337.0	73	-1.188	0.235	-1.188	0.235	10	20	NO
ZINC	**192.5**	**272.5**	**63**	**1.650**	**0.099**	**1.650**	**0.099**	**10**	**20**	**YES**

SEDIMENT BACKGROUND STATISTICS - RESULTS OF WILCOXON RANK SUM TEST
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

METAL	Rank Sum SITE	Rank Sum BACK	U	Z	p-level	Z adjusted	p-level	Valid N SITE	Valid N BACK	SITE ABOVE BACKGROUND
ALUMINUM	97	156	20	2.0642	0.0390	2.0642	0.0390	6	16	YES
ANTIMONY	117	136	0	3.5386	0.0004	3.5436	0.0004	6	16	YES
ARSENIC	113	140	4	3.2437	0.0012	3.2456	0.0012	6	16	YES
BARIUM	106	147	11	2.7277	0.0064	2.7277	0.0064	6	16	YES
BERYLLIUM	110	143	7	3.0226	0.0025	3.1043	0.0019	6	16	YES
CADMIUM	117	136	0	3.5386	0.0004	3.5476	0.0004	6	16	YES
CALCIUM	99	154	18	2.2116	0.0270	2.2116	0.0270	6	16	YES
CHROMIUM, TOTAL	88	165	29	1.4007	0.1613	1.4007	0.1613	6	16	YES
COBALT	81	172	36	0.8847	0.3764	0.8857	0.3758	6	16	YES
COPPER	105.5	147.5	11.5	2.6908	0.0071	2.6916	0.0071	6	16	YES
IRON	87	166	30	1.3270	0.1845	1.3270	0.1845	6	16	YES
LEAD	96	157	21	1.9905	0.0465	1.9905	0.0465	6	16	YES
MAGNESIUM	78.5	174.5	38.5	0.7003	0.4837	0.7007	0.4835	6	16	NO
MANGANESE	93.5	159.5	23.5	1.8062	0.0709	1.8067	0.0708	6	16	YES
MERCURY	91	99	8	2.7189	0.0066	2.7443	0.0061	6	13	YES
MOLYBDENUM	--	--	0	0.0000	1.0000	0.0000	0.0000	6	0	NO
NICKEL	90	163	27	1.5481	0.1216	1.5481	0.1216	6	16	YES
POTASSIUM	57	196	36	-0.8847	0.3764	-0.8847	0.3764	6	16	NO
SELENIUM	117	136	0	3.5386	0.0004	3.5406	0.0004	6	16	YES
SILVER	117	136	0	3.5386	0.0004	3.5466	0.0004	6	16	YES
SODIUM	117	136	0	3.5386	0.0004	3.5396	0.0004	6	16	YES
THALLIUM	117	136	0	3.5386	0.0004	3.5426	0.0004	6	16	YES
VANADIUM	93	160	24	1.7693	0.0769	1.7693	0.0769	6	16	YES
ZINC	108	145	9	2.8751	0.0040	2.8751	0.0040	6	16	YES

APPENDIX B

RISK ASSESSMENT TABLES
(RAGS PART D)

SITE 3 - TABLE 1

SELECTION OF EXPOSURE PATHWAYS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND
PAGE 1 OF 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Subsurface Soil(1)	Subsurface Soil	Entire Site	Maintenance/Utility/ Construction Workers	Adult	Ingestion Dermal	On-site On-site	Quant(2) Quant	Excavation/construction or intrusive activities may occur at the site. Excavation/construction or intrusive activities may occur at the site.
		Air	Vapors and Particulates in Air - Entire Site	Maintenance/Utility/ Construction Workers	Adult	Inhalation	On-site	Qual(3)	Exposure is evaluated qualitatively by a comparison of site data to USEPA Generic SSLs (4)for transfers from soil to air.
	Surface Soil	Surface Soil	Entire Site	All Potential Receptors, i.e., Workers, Recreational Users, Trespassers, Day Care Center Children, and Future Residents	Adult, Child, Adolescent	Ingestion Dermal	On-site On-site	Quant(2) Quant(2)	Exposure to surface soil may occur if potential receptors are exposed during typical receptor-related activities, such as digging and playing. Exposure to surface soil may occur if potential receptors are exposed during typical receptor-related activities, such as digging and playing.
		Air	Vapors and Particulates in Air - Entire Site	All Potential Receptors, i.e., Workers, Recreational Users, Trespassers, Day Care Center Children, and Future Residents	Adult, Child, Adolescent	Inhalation	On-site	Qual(3)	Exposure is evaluated qualitatively by a comparison of site data to USEPA Generic SSLs (4)for transfers from soil to air.
	Groundwater	Groundwater	Surficial Aquifer	Maintenance/Utility/ Construction Workers	Adult	Ingestion Dermal	On-site On-site	None Quant	Minimal exposure is anticipated. Excavation/construction or intrusive activities may occur at the site.
				Full-time Employees, Recreational Users, Trespassers, Day Care Center Children	Adult, Child, Adolescent	Ingestion Dermal	On-site On-site	None None	Surficial aquifer is not expected to be used as a domestic water supply. Surficial aquifer is not expected to be used as a domestic water supply.
				Residents	Adult and Child	Ingestion Dermal	On-site On-site	Quant Quant	Although it is unlikely that shallow groundwater at the site would be used as a domestic water supply. This scenario is included to aid in future risk management decisions Although it is unlikely that shallow groundwater at the site would be used as a domestic water supply. This scenario is included to aid in future risk management decisions.
		Air	Vapors	Maintenance/Utility/ Construction Workers	Adult	Inhalation	Outdoor On-site	Quant	Workers may be exposed to volatile organic compounds volatilizing from groundwater into outdoor ambient air.
				Full-time Workers	Adult	Inhalation	Indoor and Outdoor On-site	Quant	Workers may be exposed to volatile organic compounds volatilizing from groundwater into indoor and outdoor ambient air.
				Recreational Users	Adult	Inhalation	Outdoor On-site	None	Exposure of recreational users to vapors from groundwater is expected to be minimal.
				Trespassers	Adolescent	Inhalation	Outdoor On-site	None	Exposure of trespassers to vapors from groundwater is expected to be minimal.
				Day Care Center Children	Child	Inhalation	Indoor On-site	Quant	Children may be exposed to volatile organic compounds volatilizing from groundwater into indoor ambient air.
				Residents	Adult and Child	Inhalation	Indoor and Outdoor On-site	Quant	Future residents may be exposed to volatile organic compounds volatilizing from groundwater into indoor and outdoor ambient air and while bathing or showering.

SITE 3 - TABLE 1

SELECTION OF EXPOSURE PATHWAYS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND
PAGE 2 OF 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Water	Surface Water	On-Site Ditches and Paint Branch Creek	Maintenance/Utility/ Construction Workers	Adults	Ingestion	On-site	None	Minimal exposure is anticipated.
						Dermal	On-site	Quant	Workers may be exposed in the course of work activities, such as digging trenches.
				Full-time Workers	Adults	Ingestion	On-site	None	Minimal exposure is anticipated.
						Dermal	On-site	None	Minimal exposure is anticipated.
				Recreational Users	Adults	Ingestion	On-site	Quant	Receptors may be exposed during on-site activities.
						Dermal	On-site	Quant	Receptors may be exposed during on-site activities.
				Trespassers	Adolescent	Ingestion	On-slte	Quant	Receptors may be exposed while trespassing on-site.
						Dermal	On-site	Quant	Receptors may be exposed while trespassing on-site.
				Day Care Center Children	Child	Ingestion	On-site	None	Minimal exposure is anticipated.
						Dermal	On-site	None	Minimal exposure is anticipated.
				Resident	Adult and Child	Ingestion	On-site	Quant	Although the scenario is unlikely, a residential scenario is included to aid in future risk management decisions.
						Dermal	On-site	Quant	Although the scenario is unlikely, a residential scenario is included to aid in future risk management decisions.
		Air	Vapors from Water in On-site Ditches	All Potential Receptors	Adult, Child, Adolescent	Inhalation	On-site	None	Minimal exposure is anticipated.
	Sediment	Sediment	On-Site Ditches and Paint Branch Creek	Maintenance/Utility/ Construction Workers	Adults	Ingestion	On-site	Quant	Workers may be exposed in the course of work activities, such as digging trenches.
						Dermal	On-site	Quant	Workers may be exposed in the course of work activities, such as digging trenches.
				Full-time Workers	Adults	Ingestion	On-site	None	Minimal exposure is anticipated.
						Dermal	On-site	None	Minimal exposure is anticipated.
				Recreational Users	Adults	Ingestion	On-site	Quant	Receptors may be exposed during on-site activities.
						Dermal	On-site	Quant	Receptors may be exposed during on-site activities.
				Trespassers	Adolescent	Ingestion	On-site	Quant	Receptors may be exposed while trespassing on-site.
						Dermal	On-site	Quant	Receptors may be exposed while trespassing on-site.
				Day Care Center Children	Child	Ingestion	On-site	None	Minimal exposure is anticipated.
						Dermal	On-site	None	Minimal exposure is anticipated.
				Resident	Adult and Child	Ingestion	On-site	Quant	Although the scenario is unlikely, a residential scenario is included to aid in future risk management decisions.
						Dermal	On-site	Quant	Although the scenario is unlikely, a residential scenario is included to aid in future risk management decisions.

Footnotes:

1 Subsurface soil is defined as soil collected from depths greater than 0.5 feet below ground surface (bgs).

2 Quantitative.

3 Qualitative.

4 Soil Screening Levels (USEPA, May 1996).

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
67-64-1	Acetone	0.005	J	0.006	J	mg/kg	003-SS-04	4/10	0.012 - 0.013	0.006	NA	780	N	16 100000	SSL_MIGR SSL_INH	No	BSL
108-90-7	Chlorobenzene	0.004	J	0.004	J	mg/kg	003-SS-02	1/10	0.011 - 0.013	0.004	NA	160	N	1 130	SSL_MIGR SSL_INH	No	BSL
540-59-0	1,2-Dichloroethene (total)	0.015		0.015		mg/kg	003-SS-02	1/10	0.011 - 0.013	0.015	NA	70	N	0.4 1200	SSL_MIGR SSL_INH	No	BSL
78-93-3	Methyl Ethyl Ketone	0.005	J	0.006	J	mg/kg	003-SS-10	3/10	0.012 - 0.013	0.006	NA	4700	N	NA	SSL_MIGR SSL_INH	No	BSL
591-78-6	2-Hexanone	0.0006	J	0.0007	J	mg/kg	003-SS-10	2/10	0.011 - 0.013	0.0007	NA	310	N	NA	SSL_MIGR SSL_INH	No	BSL
108-10-1	4-Methyl-2-pentanone	0.0008	J	0.0008	J	mg/kg	003-SS-09	1/10	0.012 - 0.013	0.0008	NA	630	N	NA	SSL_MIGR SSL_INH	No	BSL
75-09-2	Methylene Chloride	0.001	J	0.002	J	mg/kg	003-SS-01	7/10	0.011 - 0.013	0.002	NA	85	C	0.02 13	SSL_MIGR SSL_INH	No	BSL
79-01-6	Trichloroethene	0.001	J	0.025		mg/kg	003-SS-02	2/10	0.011 - 0.013	0.025	NA	58	N	0.06 5	SSL_MIGR SSL_INH	No	BSL
83-32-9	Acenaphthene	0.71	J	0.71	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.71	NA	470	N	570	SSL_MIGR SSL_INH	No	BSL
120-12-7	Anthracene	0.042	J	2.8		mg/kg	003-SS-01	4/10	0.37 - 0.78	2.8	NA	2300	N	12000	SSL_MIGR SSL_INH	No	BSL
56-55-3	Benzo(a)anthracene	0.097	J	2.4		mg/kg	003-SS-01	5/10	0.37 - 0.83	2.4	NA	0.87	C	2	SSL_MIGR SSL_INH	Yes	ASL
50-32-8	Benzo(a)pyrene	0.075	J	1.8		mg/kg	003-SS-01	5/10	0.37 - 0.83	1.8	NA	0.087	C	8	SSL_MIGR SSL_INH	Yes	ASL
205-99-2	Benzo(b)fluoranthene	0.11	J	2.3		mg/kg	003-SS-01	5/10	0.37 - 0.83	2.3	NA	0.87	C	5	SSL_MIGR SSL_INH	Yes	ASL
191-24-2	Benzo(g,h,i)perylene	0.16	J	0.76	J	mg/kg	003-SS-01	2/10	0.37 - 0.83	0.76	NA	160(6)	N	84	SSL_MIGR SSL_INH	No	BSL
207-08-9	Benzo(k)fluoranthene	0.041	J	1.1	J	mg/kg	003-SS-01	3/10	0.37 - 0.83	1.1	NA	8.7	C	49	SSL_MIGR SSL_INH	No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.12	J	1.8		mg/kg	003-SS-02	2/10	0.37 - 1.5	1.8	NA	46	C	3600 31000	SSL_MIGR SSL_INH	No	BSL
86-74-8	Carbazole	0.8	J	0.8	J	mg/kg	003-SS-01	1/10	0.37 - 1.8	0.8	NA	32	C	0.6	SSL_MIGR SSL_INH	No	BSL
218-01-9	Chrysene	0.1	J	2.4		mg/kg	003-SS-01	5/10	0.37 - 0.83	2.4	NA	87	C	160	SSL_MIGR SSL_INH	No	BSL
84-74-2	Di-n-butyl phthalate	0.054	J	0.14	J	mg/kg	003-SS-02	2/10	0.37 - 1.5	0.14	NA	780	N	2300 2300	SSL_MIGR SSL_INH	No	BSL

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
53-70-3	Dibenzo(a,h)anthracene	0.22	J	0.22	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.22	NA	0.087	C	2	SSL_MIGR SSL_INH	Yes	ASL
132-64-9	Dibenzofuran	0.41	J	0.41	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.41	NA	31	N	NA	SSL_MIGR SSL_INH	No	BSL
206-44-0	Fluoranthene	0.18	J	8.2		mg/kg	003-SS-01	5/10	0.37 - 0.83	8.2	NA	310	N	4300	SSL_MIGR SSL_INH	No	BSL
86-73-7	Fluorene	1.1	J	1.1	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	1.1	NA	310	N	560	SSL_MIGR SSL_INH	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.15	J	0.77	J	mg/kg	003-SS-01	2/10	0.37 - 0.83	0.77	NA	0.87	C	14	SSL_MIGR SSL_INH	No	BSL
91-20-3	Naphthalene	0.28	J	0.28	J	mg/kg	003-SS-01	1/10	0.37 - 0.83	0.28	NA	160	N	84	SSL_MIGR SSL_INH	No	BSL
85-01-8	Phenanthrene	0.05	J	7.6		mg/kg	003-SS-01	6/10	0.37 - 0.41	7.6	NA	160(6)	N	84	SSL_MIGR SSL_INH	No	BSL
129-00-0	Pyrene	0.085	J	5.4		mg/kg	003-SS-01	6/10	0.37 - 0.41	5.4	NA	230	N	4200	SSL_MIGR SSL_INH	No	BSL
120-82-1	1,2,4-Trichlorobenzene	0.072	J	0.34	J	mg/kg	003-SS-01	4/10	0.37 - 0.83	0.34	NA	78	N	5 3200	SSL_MIGR SSL_INH	No	BSL
5103-74-2	gamma-Chlordane	0.073		0.073		mg/kg	003-SS-03	1/10	0.0019 - 0.041	0.073	NA	1.8(7)	C	10 20	SSL_MIGR SSL_INH	No	BSL
72-54-8	4,4'-DDD	0.014	J	0.078		mg/kg	003-SS-06	10/10	---	0.078	NA	2.7	C	16	SSL_MIGR SSL_INH	No	BSL
72-55-9	4,4'-DDE	0.0012	J	0.032	J	mg/kg	003-SS-01	7/10	0.039 - 0.08	0.032	NA	1.9	C	54	SSL_MIGR SSL_INH	No	BSL
50-29-3	4,4'-DDT	0.023	J	0.71		mg/kg	003-SS-02	10/10	---	0.71	NA	1.9	C	32	SSL_MIGR SSL_INH	No	BSL
11096-82-5	Aroclor-1260	0.057		4.9		mg/kg	003-SS-01	10/10	---	4.9	NA	0.32	C	NA	SSL_MIGR SSL_INH	Yes	ASL
7429-90-5	Aluminum	1820		20100		mg/kg	003-SS-05	10/10	---	20100	NA	7800	N	NA	SSL_MIGR SSL_INH	No	BKG
7440-36-0	Antimony	0.9	J	13.5	J	mg/kg	003-SS-03	4/10	13.6 - 15.1	13.5	NA	3.1	N	5	SSL_MIGR SSL_INH	Yes	ASL
7440-38-2	Arsenic	0.7	J	4		mg/kg	003-SS-05	10/10	---	4	NA	0.43	C	29 750	SSL_MIGR SSL_INH	No	BKG
7440-39-3	Barium	14	J	101		mg/kg	003-SS-02	10/10	---	101	NA	550	N	1600 690000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-41-7	Beryllium	0.14	J	0.14	J	mg/kg	003-SS-10	1/10	1.1 - 1.3	0.14	NA	16		63 1300	SSL_MIGR SSL_INH	No	BSL

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7440-43-9	Cadmium	0.21	J	2.3		mg/kg	003-SS-02	6/10	1.1 - 1.3	2.3	NA	7.8	N	8 1800	SSL_MIGR SSL_INH	No	BSL
7440-70-2	Calcium	206	J	4200		mg/kg	003-SS-06	10/10	---	4200	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT
7440-47-3	Chromium	8		34.5		mg/kg	003-SS-01	10/10	---	34.5	NA	23(8)	N	38 270	SSL_MIGR SSL_INH	No	BKG
7440-48-4	Cobalt	1.5	J	10	J	mg/kg	003-SS-02	10/10	---	10	NA	470	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG
7440-50-8	Copper	2.3		437		mg/kg	003-SS-03	10/10	---	437	NA	310	N	NA	SSL_MIGR SSL_INH	Yes	ASL
7439-89-6	Iron	3700		23800		mg/kg	003-SS-05	10/10	---	23800	NA	2300	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-92-1	Lead	1.9		76.8		mg/kg	003-SS-02	10/10	---	76.8	NA	400(9)		NA	SSL_MIGR SSL_INH	No	BKG
7439-95-4	Magnesium	295	J	2830	J	mg/kg	003-SS-02	10/10	---	2830	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7439-96-5	Manganese	14.3		293		mg/kg	003-SS-02	10/10	---	293	NA	160(10)	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-97-6	Mercury	0.097	J	3.8		mg/kg	003-SS-02	10/10	---	3.8	NA	2.3(11)	N	NA	SSL_MIGR SSL_INH	No	BSL
7439-98-7	Molybdenum	0.44	J	2.1		mg/kg	003-SS-03	7/10	0.91 - 1	2.1	NA	39	N	NA	SSL_MIGR SSL_INH	No	BSL
7440-02-0	Nickel	2.3	J	38.7	J	mg/kg	003-SS-02	10/10	---	38.7	NA	160	N	130 13000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-09-7	Potassium	163	J	856	J	mg/kg	003-SS-02	10/10	---	856	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7782-49-2	Selenium	0.7	J	2.6		mg/kg	003-SS-06	5/10	1.1 - 1.3	2.6	NA	39	N	5	SSL_MIGR SSL_INH	No	BSL
7440-22-4	Silver	0.27	J	147		mg/kg	003-SS-06	6/10	2.3 - 2.5	147	NA	39	N	34	SSL_MIGR SSL_INH	Yes	ASL
7440-23-5	Sodium	393	J	393	J	mg/kg	003-SS-02	1/10	1130 - 1260	393	NA	NA		NA	SSL_MIGR SSL_INH	No	NUT
7440-62-2	Vanadium	3.8		55.7		mg/kg	003-SS-01	10/10	---	55.7	NA	55	N	6000	SSL_MIGR SSL_INH	No	BKG
7440-66-6	Zinc	9.5		1010		mg/kg	003-SS-02	10/10	---	1010	NA	2300	N	12000	SSL_MIGR SSL_INH	No	BSL

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)	Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)

Footnotes:
1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a PCOC.
4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).
5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level and facility-wide background levels.
6 Naphthalene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
7 Value for chlordane is used.
8 Chromium as hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 1994)
10 Manganese-Nonfood.
11 Mercury as Mercuric Chloride.

Associated Samples:

003-SS-01	003-SS-06
003-SS-02	003-SS-07
003-SS-03	003-SS-08
003-SS-04	003-SS-09
003-SS-05	003-SS-10

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
NUT = Essential Nutrient

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
SSL-MIGR = Soil Screening Level for transfers from soil to groundwater for a Dilution and Attenuation Factor of 20 (USEPA, May 1996)

TABLE 2.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
75-09-2	Methylene Chloride	0.001	J	0.002	J	mg/kg	0003-SD-02	4/6	0.012 - 0.016	0.002	NA	85	N	No	BSL
83-32-9	Acenaphthene	0.16	J	0.28	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.28	NA	470	N	No	BSL
120-12-7	Anthracene	0.37	J	0.68	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.68	NA	2300	N	No	BSL
56-55-3	Benzo(a)anthracene	0.16	J	1.3		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.3	NA	0.87	C	Yes	ASL
50-32-8	Benzo(a)pyrene	0.2	J	1.2		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.2	NA	0.087	C	Yes	ASL
205-99-2	Benzo(b)fluoranthene	0.27	J	1.7		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.7	NA	0.87	C	Yes	ASL
191-24-2	Benzo(g,h,i)perylene	0.34	J	0.43	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.43	NA	160(6)	N	No	BSL
207-08-9	Benzo(k)fluoranthene	0.43	J	0.58	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.58	NA	8.7	C	No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.14	J	0.25	J	mg/kg	0003-SD-03	3/6	0.78 - 0.98	0.25	NA	46	C	No	BSL
218-01-9	Chrysene	0.18	J	1.1		mg/kg	0003-SD-02	3/6	0.78 - 0.98	1.1	NA	87	C	No	BSL
53-70-3	Dibenzo(a,h)anthracene	0.13	J	0.13	J	mg/kg	0003-SD-02	1/6	0.78 - 1.0	0.13	NA	0.087	C	Yes	ASL
132-64-9	Dibenzofuran	0.15	J	0.15	J	mg/kg	0003-SD-02	1/6	0.78 - 1.1	0.15	NA	31	N	No	BSL
206-44-0	Fluoranthene	0.32	J	2.6		mg/kg	0003-SD-02	3/6	0.78 - 0.98	2.6	NA	310	N	No	BSL
86-73-7	Fluorene	0.22	J	0.34	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.34	NA	310	N	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.32	J	0.41	J	mg/kg	0003-SD-02	2/6	0.78 - 1.0	0.41	NA	0.87	C	No	BSL
91-20-3	Naphthalene	0.11	J	0.11	J	mg/kg	0003-SD-02	1/6	0.78 - 1.1	0.11	NA	160	N	No	BSL
85-01-8	Phenanthrene	0.18	J	2.4		mg/kg	0003-SD-02	3/6	0.78 - 0.98	2.4	NA	160(6)	N	No	BSL
129-00-0	Pyrene	0.32	J	2.2		mg/kg	0003-SD-02	3/6	0.78 - 0.98	2.2	NA	230	N	No	BSL
120-82-1	1,2,4-Trichlorobenzene	0.21	J	0.21	J	mg/kg	0003-SD-01	1/6	0.78 - 1.1	0.21	NA	78	N	No	BSL
5103-71-9	alpha-Chlordane	0.0018	J	0.24		mg/kg	0003-SD-01	3/6	0.02 - 0.28	0.24	NA	1.8(7)	C	No	BSL

TABLE 2.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
5103-74-2	gamma-Chlordane	0.0011	J	0.19		mg/kg	0003-SD-01	3/6	0.02 - 0.28	0.19	NA	1.8(7)	C	No	BSL
72-54-8	4,4'-DDD	0.27		0.27		mg/kg	0003-SD-01	1/6	0.0049 - 0.54	0.27	NA	2.7	C	No	BSL
50-29-3	4,4'-DDT	0.0018	J	5.3		mg/kg	0003-SD-03	5/6	0.0049	5.3	NA	1.9	C	Yes	ASL
11097-69-1	Aroclor-1254	0.031		10		mg/kg	03SD0020006	12/12	---	10	NA	0.32	C	Yes	ASL
11096-82-5	Aroclor-1260	0.015		8.8		mg/kg	03SD0020006	3/12	0.039 - 0.41	8.8	NA	0.32	C	Yes	ASL
7429-90-5	Aluminum	2270		17400		mg/kg	0003-SD-03	6/6	---	17400	NA	7800	N	Yes	ASL
7440-36-0	Antimony	1.4	J	3.3	J	mg/kg	0003-SD-03	3/6	14.2 - 17.8	3.3	NA	3.1	N	Yes	ASL
7440-38-2	Arsenic	2.4	J	6.8		mg/kg	0003-SD-01	6/6	---	6.8	NA	0.43	C	Yes	ASL
7440-39-3	Barium	31.2	J	276		mg/kg	0003-SD-03	6/6	---	276	NA	550	N	No	BSL
7440-43-9	Cadmium	0.94	J	8.8		mg/kg	0003-SD-03	4/6	1.5	8.8	NA	7.8	N	Yes	ASL
7440-70-2	Calcium	196	J	3630		mg/kg	0003-SD-06	6/6	---	3630	NA	NA		No	NUT
7440-47-3	Chromium	8.7		43.9		mg/kg	0003-SD-03	6/6	---	43.9	NA	23(8)	N	Yes	ASL
7440-48-4	Cobalt	3.6	J	15.5	J	mg/kg	0003-SD-03	6/6	---	15.5	NA	470	N	No	BSL
7440-50-8	Copper	7.7		370		mg/kg	0003-SD-03	6/6	---	370	NA	310	N	Yes	ASL
7439-89-6	Iron	8450		29300		mg/kg	0003-SD-03	6/6	---	29300	NA	2300	N	Yes	ASL
7439-92-1	Lead	5.4		211		mg/kg	0003-SD-03	6/6	---	211	NA	400(9)		No	BSL
7439-95-4	Magnesium	1220	J	2520		mg/kg	0003-SD-03	6/6	---	2520	NA	NA		No	NUT, BKG
7439-96-5	Manganese	178		1000		mg/kg	0003-SD-03	6/6	---	1000	NA	160(10)	N	Yes	ASL
7439-97-6	Mercury	0.04		6.2		mg/kg	03SD0020006	10/11	0.04	6.2	NA	2.3(11)	N	Yes	ASL
7439-98-7	Molybdenum	0.77	J	6.5		mg/kg	0003-SD-03	6/6	---	6.5	NA	39	N	No	BSL

TABLE 2.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN - SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Background Value(3)	Risk-Based Residential PCOC Screening Level(4)		PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7440-02-0	Nickel	12.4		68.6		mg/kg	0003-SD-03	6/6	---	68.6	NA	160	N	No	BSL
7440-09-7	Potassium	153	J	909	J	mg/kg	0003-SD-03	6/6	---	909	NA	NA		No	NUT, BKG
7782-49-2	Selenium	1	J	3.1		mg/kg	0003-SD-03	6/6	---	3.1	NA	39	N	No	BSL
7440-22-4	Silver	0.026		14.8		mg/kg	03SD0020006	11/11	---	14.8	NA	39	N	No	BSL
7440-62-2	Vanadium	7.9	J	77.5		mg/kg	0003-SD-03	6/6	---	77.5	NA	55	N	Yes	ASL
7440-66-6	Zinc	45.6		871		mg/kg	0003-SD-03	6/6	---	871	NA	2300	N	No	BSL

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

Footnotes:

1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a PCOC.
4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).
5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level and facility-wide background levels.
6 Naphthalene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
7 Value for chlordane is used.
8 Chromium as hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 1994)
10 Manganese-Nonfood.
11 Mercury as Mercuric Chloride.

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
NUT = Essential Nutrient

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern

Associated Samples (collected in November 2000):

0003-SD-01	0003-SD-04
0003-SD-02	0003-SD-05
0003-SD-03	0003-SD-06

Samples collected in April 2002 and analyzed for PCBs, mercury, and silver:

03SD0010006	03SD0050006	03SD0090006
03SD0020006	03SD0060006	03SD00100006
03SD0030006	03SD0070006	03SD00110006
03SD0040006	03SD0080006	03SD00120006

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE / SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface / SubsurfaceSoil
Exposure Point: Surface / Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	4.44E-01	NA	2.40E+00		mg/kg	1.51E+00	95% UCL-T	W - Test (3)	1.51E+00	95% UCL-T	W - Test (3)
Benzo(a)pyrene	mg/kg	3.74E-01	NA	1.80E+00		mg/kg	8.94E-01	95% UCL-T	W - Test (2)	8.94E-01	95% UCL-T	W - Test (2)
Benzo(b)fluoranthene	mg/kg	4.63E-01	NA	2.30E+00		mg/kg	1.04E+00	95% UCL-T	W - Test (2)	1.04E+00	95% UCL-T	W - Test (2)
Dibenzo(a,h)anthracene	mg/kg	2.61E-01	NA	2.20E-01		mg/kg	2.20E-01	Maximum	W - Test (3)	2.20E-01	Maximum	W - Test (3)
Aroclor-1260	mg/kg	1.69E+00	NA	4.90E+00		mg/kg	4.90E+00	Maximum	W - Test (3)	4.90E+00	Maximum	W - Test (3)
Antimony	mg/kg	5.97E+00	NA	1.35E+01	J	mg/kg	8.26E+00	95% UCL-T	W - Test (4)	8.26E+00	95% UCL-T	W - Test (4)
Copper	mg/kg	7.31E+01	NA	4.37E+02		mg/kg	4.37E+02	Maximum	W - Test (3)	4.37E+02	Maximum	W - Test (3)
Mercury	mg/kg	9.21E-01	NA	3.80E+00		mg/kg	3.80E+00	Maximum	W - Test (3)	3.80E+00	Maximum	W - Test (3)
Silver	mg/kg	3.74E-01	NA	1.47E+02		mg/kg	1.47E+02	Maximum	W - Test (3)	1.47E+02	Maximum	W - Test (3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test is inconclusive. Data are assumed to be log-normally distributed.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.
(4) Shapiro-Wilk W Test indicates data are normally distributed.

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Sediment
Exposure Point: Sediment

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	6.20E-01	NA	1.30E+00		mg/kg	1.30E+00	Maximum	N<10 (1)	1.30E+00	Maximum	N<10 (1)
Benzo(a)pyrene	mg/kg	6.23E-01	NA	1.20E+00		mg/kg	1.20E+00	Maximum	N<10 (1)	1.20E+00	Maximum	N<10 (1)
Benzo(b)fluoranthene	mg/kg	7.73E-01	NA	1.70E+00		mg/kg	1.70E+00	Maximum	N<10 (1)	1.70E+00	Maximum	N<10 (1)
Dibenzo(a,h)anthracene	mg/kg	4.25E-01	NA	1.30E-01	J	mg/kg	1.30E-01	Maximum	N<10 (1)	1.30E-01	Maximum	N<10 (1)
4,4'-DDT	mg/kg	1.63E+00	NA	5.30E+00		mg/kg	5.30E+00	Maximum	N<10 (1)	5.30E+00	Maximum	N<10 (1)
Aroclor-1254	mg/kg	2.01E+00	NA	1.00E+01		mg/kg	1.00E+01	Maximum	W - Test (1)	1.00E+01	Maximum	W - Test (1)
Aroclor-1260	mg/kg	7.75E-01	NA	8.80E+00		mg/kg	3.11E+00	95% UCL-T	W - Test (2)	3.11E+00	95% UCL-T	W - Test (2)
Aluminum	mg/kg	9.30E+03	NA	1.74E+04		mg/kg	1.74E+04	Maximum	N<10 (1)	1.74E+04	Maximum	N<10 (1)
Antimony	mg/kg	5.29E+00	NA	3.30E+00	J	mg/kg	3.30E+00	Maximum	N<10 (1)	3.30E+00	Maximum	N<10 (1)
Arsenic	mg/kg	4.07E+00	NA	6.80E+00		mg/kg	6.80E+00	Maximum	N<10 (1)	6.80E+00	Maximum	N<10 (1)
Cadmium	mg/kg	3.16E+00	NA	8.80E+00		mg/kg	8.80E+00	Maximum	N<10 (1)	8.80E+00	Maximum	N<10 (1)
Chromium	mg/kg	2.15E+01	NA	4.39E+01		mg/kg	4.39E+01	Maximum	N<10 (1)	4.39E+01	Maximum	N<10 (1)
Copper	mg/kg	1.24E+02	NA	3.70E+02		mg/kg	3.70E+02	Maximum	N<10 (1)	3.70E+02	Maximum	N<10 (1)
Iron	mg/kg	1.61E+04	NA	2.93E+04		mg/kg	2.93E+04	Maximum	N<10 (1)	2.93E+04	Maximum	N<10 (1)
Manganese	mg/kg	4.19E+02	NA	1.00E+03		mg/kg	1.00E+03	Maximum	N<10 (1)	1.00E+03	Maximum	N<10 (1)
Mercury	mg/kg	6.45E-01	NA	6.20E+00		mg/kg	4.23E+00	95% UCL-T	W - Test (2)	4.23E+00	95% UCL-T	W - Test (2)
Vanadium	mg/kg	3.47E+01	NA	7.75E+01		mg/kg	7.75E+01	Maximum	N<10 (1)	7.75E+01	Maximum	N<10 (1)

(1) Dataset consists of less than 10 samples. Therefore, the maximum concentration is used as the EPC.
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution. Data are assumed to be log-normally distributed.

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD	Oral RfD Units	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal RfD[2]	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ[3]
Aroclor-1254	chronic	2.0E-05	mg/kg-day	1	2.00E-05	mg/kg-day	Immunological, Nails	300	IRIS	04/02/02
4,4'-DDT	chronic	5.0E-04	mg/kg-day	1	5.00E-04	mg/kg-day	Liver	100	IRIS	04/02/02
Aluminum	chronic	1.0E+00	mg/kg-day	1	1.00E+00	mg/kg-day	Immunological, Nails	300	NCEA	04/02/02
Antimony	chronic	4.0E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	Lifespan	1,000	IRIS	04/02/02
Arsenic	chronic	3.0E-04	mg/kg-day	1	3.00E-04	mg/kg-day	Skin, Vascular	3	IRIS	04/02/02
Barium	chronic	7.0E-02	mg/kg-day	0.07	4.90E-03	mg/kg-day	Kidney	1,000	IRIS	04/02/02
Cadmium	chronic	5.0E-04	mg/kg-day	0.025	1.25E-05	mg/kg-day	Kidney	10	IRIS	04/02/02
Chromium	chronic	1.5E+00	mg/kg-day	0.025	3.75E-02	mg/kg-day	NOAEL	1,000	IRIS	04/02/02
Copper	chronic	4.0E-02	mg/kg-day	1	4.00E-02	mg/kg-day	NA		HEAST	07/97
Iron	chronic	3.0E-01	mg/kg-day	1	3.00E-01	mg/kg-day	Liver/Blood/GI Tract		NCEA	04/02/02
Manganese	chronic	2.0E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	CNS	1	IRIS	04/02/02
Mercury	chronic	3.0E-04	mg/kg-day	0.07	2.10E-05	mg/kg-day	CNS	1,000	IRIS	04/02/02
Vanadium	chronic	7.0E-03	mg/kg-day	0.026	1.82E-04	mg/kg-day	NOEL	100	HEAST	07/97

(1) USEPA, September, 2001.
(2) RfD dermal = RfDoral x (Oral to Dermal Adjustment Factor)
(3) Dates of IRIS, HEAST, or NCEA

Notes: RfD = Reference dose
CNS = Central Nervous System
IRIS = Integrated Risk Information System, on-line database search (USEPA, June 2002)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
NCEA = USEPA National Center for Environmental Assessment (USEPA RBC Table, April 2, 2002)
NA = Not applicable since an oral RfD is not available for this compound data

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Oral CSF	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal Cancer Slope Factor[2]	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date[3]
Aroclor-1254	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	04/02/02
Aroclor-1260	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	04/02/02
Arsenic	1.5E+00	1	1.50E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	04/02/02
Benzo(a)anthracene	7.3E-01	1	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	04/02/02
Benzo(a)pyrene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	04/02/02
Benzo(b)fluoranthene	7.3E-01	1	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	04/02/02
Dibenzo(a,h)anthracene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	04/02/02
4,4'-DDT	3.4E-01	1	3.40E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	04/02/02

(1) USEPA, September, 2001.
(2) CSFdermal = CSForal/(Oral to Dermal Adjustment Factor)
(3) Date of IRIS

Notes:
CSF = Cancer Slope Factor
IRIS = Integrated Risk Information System, on-line database search (USEPA, June 2002)

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in anima inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

SITE 3 - TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	250	EPA 1993a	219	EPA 1993a	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	25	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	EPA 1989a	3,285	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	EPA 2001	0.02	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	EPA 2001	3,300	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	250	EPA 1993a	219	EPA 1993a	
	ED	Exposure Duration	(years)	25	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	EPA 1989a	3,285	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 3.49E-07
Noncancer Ingestion Intake - RME = 9.78E-07

Cancer Ingestion Intake - CTE = 5.51E-08
Noncancer Ingestion Intake - CTE = 4.29E-07

Cancer Dermal Intake - RME = 2.31E-06
Noncancer Dermal Intake - RME = 6.46E-06

Cancer Dermal Intake - CTE = 7.27E-08
Noncancer Dermal Intake - CTE = 5.66E-07

TABLE 7.1 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	8.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	4.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	8.1E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	2.0E-02
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	4.3E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.1E-02
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	3.7E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.2E-02
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.4E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	2.9E-02
	(total)												**7.2E-02**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	9.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	7.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	8.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	4.4E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	5.3E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	8.9E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.8E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	7.1E-05
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.5E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	1.2E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	9.5E-07	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	4.7E-03
	(total)												**6.9E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**7.9E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.1 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.8E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.76E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.1E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.28E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.6E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.66E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	7.7E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.61E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.7E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.42E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.9E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.5E-04	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.3E-06	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	5.1E-05	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.8E-06**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.2E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.4E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.7E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.0E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.1E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.3E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.8E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.6E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.2E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.9E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.0E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	8.8E-09	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	3.4E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.1E-06**
										Total Risk Across All Exposure Routes/Pathways	**1.3E-05**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 7.1a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	9.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.5E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	8.9E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.9E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.7E-03
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.6E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	5.4E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.3E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.3E-02
	(total)												**3.2E-02**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	8.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	6.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	7.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.7E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	7.8E-05
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.5E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	6.2E-06
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.1E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	1.0E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	8.3E-08	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	4.2E-04
	(total)												**6.0E-04**
												Total Hazard Index Across All Exposure Routes/Pathways	**3.2E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.1a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	6.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.36E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.9E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.59E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	5.7E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.19E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.85E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.7E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	5.40E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.6E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.4E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.1E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	8.1E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.1E-06**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	7.5E-09
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	8.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.2E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	9.8E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	7.2E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.5E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	5.0E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.0E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	6.0E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	3.2E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.8E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.1E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.9E-07**
										Total Risk Across All Exposure Routes/Pathways	**1.3E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

SITE 3 - TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	25	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	EPA 1989a	3,285	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.07	EPA 2001	0.01	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	EPA 2001	3,300	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	ED	Exposure Duration	(years)	25	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	EPA 1989a	3,285	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 5.03E-08
Noncancer Ingestion Intake - RME = 1.41E-07

Cancer Ingestion Intake - CTE = 4.53E-09
Noncancer Ingestion Intake - CTE = 3.52E-08

Cancer Dermal Intake - RME = 1.16E-07
Noncancer Dermal Intake - RME = 3.25E-07

Cancer Dermal Intake - CTE = 2.99E-09
Noncancer Dermal Intake - CTE = 2.32E-08

TABLE 7.2 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	3.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	6.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.2E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	2.9E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	6.2E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.5E-03
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	5.4E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.8E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.1E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	4.1E-03
	(total)												**1.0E-02**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	9.3E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.7E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	4.5E-05
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.4E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.6E-06
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.2E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	5.9E-05
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.8E-08	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	2.4E-04
	(total)												**3.5E-04**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.1E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

TABLE 8.2 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.5E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.98E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.5E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.28E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	5.2E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.83E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.08E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.5E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.93E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.2E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.2E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.9E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	7.4E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.8E-07**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.2E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	9.9E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.1E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	3.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.4E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	8.0E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.6E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	9.6E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	5.1E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	4.4E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.7E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.1E-07**
										Total Risk Across All Exposure Routes/Pathways	**1.3E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 7.2a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	7.7E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.9E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	7.3E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.5E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.8E-04
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.3E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	4.5E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	5.2E-06	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.0E-03
	(total)												**2.6E-03**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.3E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.7E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.1E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.6E-10	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.9E-10	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.2E-06
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.0E-08	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.5E-07
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	8.8E-11	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	4.2E-06
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	3.4E-09	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	1.7E-05
	(total)												**2.5E-05**
												Total Hazard Index Across All Exposure Routes/Pathways	**2.6E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.2a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.9E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.58E-09
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.95E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.7E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.44E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.27E-09
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.2E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.44E-08
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.7E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.0E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.7E-08	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.7E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.8E-08**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.2E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.1E-10
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.5E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.5E-09
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.0E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.0E-10
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	8.5E-11	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.2E-10
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.1E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.1E-09
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.5E-11	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.3E-09	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.1E-11	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.4E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**7.9E-09**
										Total Risk Across All Exposure Routes/Pathways	**9.6E-08**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

SITE 3 - TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	480	EPA 1993a	240	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	365	EPA 1989a	365	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	EPA 2001	0.1	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	EPA 2001	3,300	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	365	EPA 1989a	365	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.83E-08
Noncancer Ingestion Intake - RME = 3.38E-06

Cancer Ingestion Intake - CTE = 2.42E-08
Noncancer Ingestion Intake - CTE = 1.69E-06

Cancer Dermal Intake - RME = 9.96E-08
Noncancer Dermal Intake - RME = 6.97E-06

Cancer Dermal Intake - CTE = 3.32E-08
Noncancer Dermal Intake - CTE = 2.32E-06

TABLE 7.3 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.7E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	7.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.7E-05	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.8E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	7.0E-02
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.5E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.7E-02
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.3E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	4.3E-02
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	5.0E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	9.9E-02
	(total)												**2.5E-01**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	9.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	8.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	9.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	4.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	5.8E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	9.6E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	3.0E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	7.6E-05
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.7E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	1.3E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.0E-06	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	5.1E-03
	(total)												**7.4E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**2.6E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

TABLE 8.3 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.2E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.82E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.3E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.15E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	5.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.67E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.76E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.4E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.73E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.0E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.1E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.8E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	7.1E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.4E-07**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.4E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.0E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.5E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	9.8E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.1E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	6.8E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.4E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	8.2E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	4.4E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	3.8E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.5E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.6E-07**
										Total Risk Across All Exposure Routes/Pathways	**1.2E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 7.3a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	3.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	8.3E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.4E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	3.5E-02
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	7.4E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.8E-02
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	6.4E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.1E-02
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.5E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	5.0E-02
	(total)												**1.2E-01**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.6E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.9E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.2E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.0E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.5E-05
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	8.8E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	4.2E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	3.4E-07	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	1.7E-03
	(total)												**2.5E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.3E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

TABLE 8.3a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	2.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.91E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.58E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.5E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.84E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	5.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.88E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.2E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.37E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.0E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.1E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	9.2E-08	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	3.6E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**4.7E-07**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.7E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.4E-09
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.8E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.5E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.3E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	9.5E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.9E-09
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.3E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.6E-08
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.7E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.5E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.3E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.9E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.7E-08**
										Total Risk Across All Exposure Routes/Pathways	**5.6E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

TABLE 7.4 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	6.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	5.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	6.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	5.2E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	1.3E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.7E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	6.8E-04
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.4E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	7.9E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	9.2E-06	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.8E-03
	(total)												**4.6E-03**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	6.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	5.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	6.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.7E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	6.2E-05
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.0E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.9E-06
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.7E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	8.2E-05
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.6E-08	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	3.3E-04
	(total)												**4.6E-04**
												Total Hazard Index Across All Exposure Routes/Pathways	**5.1E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.4 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	2.9E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.12E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.75E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.8E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.04E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	5.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.31E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.3E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.63E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.2E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.2E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.0E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	3.9E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.2E-07**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	2.7E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.0E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.6E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.9E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	5.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.0E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.3E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.7E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.6E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	8.4E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	7.3E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.8E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.1E-07**
										Total Risk Across All Exposure Routes/Pathways	**1.0E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

SITE 3 - TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	30	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time-(Noncancer)	(days)	10,950	EPA 1989a	3,285	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.08	EPA 2001	0.01	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	9,000	EPA 1997a	9,000	EPA 1997a	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	ED	Exposure Duration	(years)	30	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	10,950	EPA 1989a	3,285	EPA 1989a	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 2.68E-08
Noncancer Ingestion Intake - RME = 6.26E-08

Cancer Ingestion Intake - CTE = 2.01E-09
Noncancer Ingestion Intake - CTE = 1.57E-08

Cancer Dermal Intake - RME = 1.93E-07
Noncancer Dermal Intake - RME = 4.51E-07

Cancer Dermal Intake - CTE = 3.62E-09
Noncancer Dermal Intake - CTE = 2.82E-08

TABLE 7.4a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	3.4E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	7.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.3E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	3.2E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	6.8E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.7E-04
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	5.9E-08	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.0E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.3E-06	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	4.6E-04
	(total)												**1.2E-03**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.0E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.3E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.8E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	8.1E-10	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.3E-10	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.9E-06
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.2E-08	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.1E-07
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.1E-10	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	5.1E-06
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.1E-09	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	2.1E-05
	(total)												**3.0E-05**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.2E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

TABLE 8.4a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	2.2E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.59E-09
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.31E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.1E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.53E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.4E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.23E-09
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	9.9E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.97E-08
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.7E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	8.8E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	7.6E-09	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	3.0E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.9E-08**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.1E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.7E-10
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.2E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.1E-09
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.9E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.6E-10
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.6E-10
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.5E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	5.0E-09
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.0E-11	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.6E-09	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.4E-11	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	5.3E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.5E-09**
										Total Risk Across All Exposure Routes/Pathways	**4.9E-08**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 7.5 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	3.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	7.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.6E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.7E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	6.8E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.4E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.6E-03
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.3E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	4.2E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.9E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	9.7E-03
	(total)												**2.4E-02**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	9.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.7E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	4.5E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.4E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.5E-05
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.2E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	5.9E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.8E-07	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	2.4E-03
	(total)												**3.5E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**2.8E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.5 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.1E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.74E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.09E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.9E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.60E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.60E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.3E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.64E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.9E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.1E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.8E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	7.0E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.2E-07**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	6.5E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.8E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	5.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.9E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	6.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.6E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.3E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	9.7E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.2E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	6.4E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.8E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.0E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.8E-09	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.8E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.2E-06**
										Total Risk Across All Exposure Routes/Pathways	**2.1E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

SITE 3 - TABLE 4.5

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	43	EPA 1997a	43	EPA 1997a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	EPA 1989a	3,650	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	EPA 2001	0.04	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,263	EPA 1997a	3,263	EPA 1997a	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	43	EPA 1997a	43	EPA 1997a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	EPA 1989a	3,650	EPA 1989a	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.73E-08
Noncancer Ingestion Intake - RME = 3.31E-07

Cancer Ingestion Intake - CTE = 1.18E-08
Noncancer Ingestion Intake - CTE = 8.28E-08

Cancer Dermal Intake - RME = 4.63E-07
Noncancer Dermal Intake - RME = 3.24E-06

Cancer Dermal Intake - CTE = 3.09E-08
Noncancer Dermal Intake - CTE = 2.16E-07

TABLE 7.5a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	9.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	7.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	8.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	4.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	6.8E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	1.7E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	3.6E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	9.0E-04
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	3.1E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.0E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.2E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	2.4E-03
	(total)												**6.1E-03**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	3.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	6.2E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.8E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.0E-05
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	9.4E-08	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.4E-06
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	8.2E-10	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	3.9E-05
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	3.2E-08	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	1.6E-04
	(total)												**2.3E-04**
										Total Hazard Index Across All Exposure Routes/Pathways			**6.3E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

TABLE 8.5a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	9.36E-09
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.72E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.2E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	9.00E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.6E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.90E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	5.8E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.16E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	9.8E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	5.2E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	4.5E-08	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.7E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.3E-07**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.3E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.2E-09
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.6E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.6E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.2E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.1E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	8.8E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.4E-09
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.1E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.2E-08
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.6E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.3E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.2E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.5E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.1E-08**
										Total Risk Across All Exposure Routes/Pathways	**3.1E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

SITE 3 - TABLE 4.6

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	200	EPA 1993a	100	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	250	EPA 1993a	219	EPA 1993a	
	FI	Fraction Ingested	(unitless)	0.5	Professional Judgement	0.5	Professional Judgement	
	ED	Exposure Duration	(years)	6	Professional Judgement	3	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	15	EPA 1989a	15	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	EPA 1989a	1,095	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	EPA 2001	0.04	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	2,800	EPA 2001	2,800	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	250	EPA 1993a	219	EPA 1993a	
	ED	Exposure Duration	(years)	6	Professional Judgement	3	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	15	EPA 1989a	15	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	EPA 1989a	1,095	EPA 1989a	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 3.91E-07
Noncancer Ingestion Intake - RME = 4.57E-06

Cancer Ingestion Intake - CTE = 8.57E-08
Noncancer Ingestion Intake - CTE = 2.00E-06

Cancer Dermal Intake - RME = 3.29E-06
Noncancer Dermal Intake - RME = 3.84E-05

Cancer Dermal Intake - CTE = 1.92E-07
Noncancer Dermal Intake - CTE = 4.48E-06

TABLE 7.6 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.9E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.2E-05	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.8E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	9.4E-02
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.0E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.0E-02
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.7E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	5.8E-02
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.7E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.3E-01
	(total)												**3.4E-01**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.4E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	5.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.6E-05	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.2E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	5.3E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.7E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.2E-04
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.5E-07	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	6.9E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	5.6E-06	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	2.8E-02
	(total)												**4.1E-02**
												Total Hazard Index Across All Exposure Routes/Pathways	**3.8E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.6 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.2E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.09E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.5E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.55E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.1E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.98E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	8.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.29E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.9E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.84E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.2E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.7E-04	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.5E-06	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	5.8E-05	mg/kg-day		(mg/kg-day)-1	
	(total)										**7.6E-06**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.6E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.4E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.8E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.8E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.5E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.2E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	9.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.9E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.3E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.5E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.7E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.4E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.2E-08	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.8E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.6E-06**
										Total Risk Across All Exposure Routes/Pathways	**1.6E-05**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 7.6a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	2.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	4.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	9.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.7E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	4.1E-02
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	8.7E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.2E-02
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	7.6E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.5E-02
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.9E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	5.9E-02
	(total)												**1.5E-01**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	6.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	5.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	6.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.7E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	6.2E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.0E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.9E-05
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.7E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	8.1E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.6E-07	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	3.3E-03
	(total)												**4.8E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.5E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.6a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	9.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	6.78E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	7.7E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.59E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	8.9E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	6.52E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.9E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.38E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	4.2E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	8.40E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	7.1E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	3.7E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	3.3E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.3E-05	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.7E-06**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	2.7E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.0E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.6E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.9E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	5.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.0E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.3E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.6E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.6E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	8.4E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	7.3E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.8E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.1E-07**
										Total Risk Across All Exposure Routes/Pathways	**2.2E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

SITE 3 - TABLE 4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	24	EPA 1993a	7	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	EPA 1989a	2,555	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.07	EPA 2001	0.01	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	5,700	EPA 2001	5,700	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	ED	Exposure Duration	(years)	24	EPA 1993a	7	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	EPA 1989a	2,555	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.70E-07
Noncancer Ingestion Intake - RME = 1.37E-06

Cancer Ingestion Intake - CTE = 4.58E-08
Noncancer Ingestion Intake - CTE = 4.58E-07

Cancer Dermal Intake - RME = 1.87E-06
Noncancer Dermal Intake - RME = 5.47E-06

Cancer Dermal Intake - CTE = 5.22E-08
Noncancer Dermal Intake - CTE = 5.22E-07

TABLE 7.7 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.4E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	3.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	6.7E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.1E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	2.8E-02
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	6.0E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.5E-02
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	5.2E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.7E-02
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.0E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	4.0E-02
	(total)												**1.0E-01**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	7.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	6.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	7.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.7E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.5E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	7.5E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.4E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	6.0E-05
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.1E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	9.9E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	8.0E-07	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	4.0E-03
	(total)												**5.8E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.1E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14

PAHs - 0.13

TABLE 8.7 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.1E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.71E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.2E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.06E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.9E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.57E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.54E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.3E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.60E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.9E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.1E-04	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.8E-06	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.9E-05	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.1E-06**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	2.6E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.9E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	2.2E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.6E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	2.5E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.9E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	5.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.9E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	1.3E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.6E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.5E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	8.2E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	7.1E-09	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.8E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**4.9E-06**
										Total Risk Across All Exposure Routes/Pathways	**1.4E-05**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 7.7a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.8E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	9.5E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.0E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.0E-03
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.7E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	5.8E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.7E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.3E-02
	(total)												**3.4E-02**
Dermal	Behzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	7.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	6.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	7.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.3E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	7.2E-05
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.3E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.7E-06
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.0E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	9.4E-05
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	7.7E-08	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	3.8E-04
	(total)												**5.6E-04**
										Total Hazard Index Across All Exposure Routes/Pathways			**3.4E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.7a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.62E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.99E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.8E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.48E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.35E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.2E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.49E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.8E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.0E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.7E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.7E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.9E-07**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	7.4E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.4E-09
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	6.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.4E-08
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	7.1E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.2E-09
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.1E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.6E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	7.2E-08
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.3E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.3E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	2.0E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	7.7E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.4E-07**
										Total Risk Across All Exposure Routes/Pathways	**1.0E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

SITE 3 - TABLE 4.8

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	200	EPA 1993a	100	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	6	EPA 1993a	2	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	15	EPA 1989a	15	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	EPA 1989a	730	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	EPA 2001	0.04	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	2,800	EPA 2001	2,800	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	ED	Exposure Duration	(years)	6	EPA 1993a	2	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	15	EPA 1989a	15	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	EPA 1989a	730	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 1.10E-06
Noncancer Ingestion Intake - RME = 1.28E-05

Cancer Ingestion Intake - CTE = 1.22E-07
Noncancer Ingestion Intake - CTE = 4.27E-06

Cancer Dermal Intake - RME = 3.07E-06
Noncancer Dermal Intake - RME = 3.58E-05

Cancer Dermal Intake - CTE = 1.37E-07
Noncancer Dermal Intake - CTE = 4.79E-06

TABLE 7.8 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.4E-05	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.1E-05	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.3E-05	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	6.3E-05	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.1E-04	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	2.6E-01
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	5.6E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.4E-01
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	4.9E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.6E-01
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.9E-03	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	3.8E-01
	(total)												**9.4E-01**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	5.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	4.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.5E-05	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.0E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	4.9E-03
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.6E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.9E-04
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.4E-07	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	6.5E-03
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	5.3E-06	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	2.6E-02
	(total)												**3.8E-02**
										Total Hazard Index Across All Exposure Routes/Pathways			**9.8E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.8 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.2E-06	mg/kg-day	7.30E-01	(mg/kg-day)-1	8.67E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	9.8E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.15E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.1E-06	mg/kg-day	7.30E-01	(mg/kg-day)-1	8.33E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.4E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.76E-06
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	5 4E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.07E-05
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	9.1E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	4.8E-04	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	4.2E-06	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.6E-04	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.1E-05**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.3E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.2E-07
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.6E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.6E-06
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.2E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.0E-07
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	8.8E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.4E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.1E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.2E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	2.5E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.3E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.2E-08	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	4.5E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.1E-06**
										Total Risk Across All Exposure Routes/Pathways	**2.9E-05**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 7.8a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	4.6E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	3.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	4.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	9.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	2.1E-05	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	3.5E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	8.8E-02
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	1.9E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.7E-02
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.6E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	5.4E-02
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	6.3E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.3E-01
	(total)												**3.1E-01**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	6.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	5.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	6.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	1.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	3.3E-06	mg/kg-day		mg/kg-day	NA	NA	
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	4.0E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	6.6E-04
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	2.1E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.2E-05
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	1.8E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	8.7E-04
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	7.0E-07	mg/kg-day	2.00E-04	mg/kg-day	NA	NA	3.5E-03
	(total)												**5.1E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**3.2E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

TABLE 8.8a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.3E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	9.66E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.1E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.97E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.3E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	9.28E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	2.7E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.96E-07
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	6.0E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.20E-06
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.0E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	5.3E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	4.6E-07	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	1.8E-05	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.4E-06**
Dermal	Benzo(a)anthracene	1.08E+00	mg/kg	1.08E+00	mg/kg	M	1.9E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.4E-08
	Benzo(a)pyrene	8.94E-01	mg/kg	8.94E-01	mg/kg	M	1.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.2E-07
	Benzo(b)fluoranthene	1.04E+00	mg/kg	1.04E+00	mg/kg	M	1.9E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.4E-08
	Dibenzo(a,h)anthracene	2.20E-01	mg/kg	2.20E-01	mg/kg	M	3.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.9E-08
	Aroclor-1260	4.90E+00	mg/kg	4.90E+00	mg/kg	M	9.4E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.9E-07
	Antimony	8.26E+00	mg/kg	8.26E+00	mg/kg	M	1.1E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	4.37E+02	mg/kg	4.37E+02	mg/kg	M	6.0E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	3.80E+00	mg/kg	3.80E+00	mg/kg	M	5.2E-10	mg/kg-day		(mg/kg-day)-1	
	Silver	1.47E+02	mg/kg	1.47E+02	mg/kg	M	2.0E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.6E-07**
										Total Risk Across All Exposure Routes/Pathways	**2.7E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13

SITE 3 - TABLE 4.9

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	25	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	EPA 1989a	3,285	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.07	EPA 2001	0.01	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	EPA 2001	3,300	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	ED	Exposure Duration	(years)	25	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	EPA 1989a	3,285	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 5.03E-08
Noncancer Ingestion Intake - RME = 1.41E-07

Cancer Ingestion Intake - CTE = 4.53E-09
Noncancer Ingestion Intake - CTE = 3.52E-08

Cancer Dermal Intake - RME = 1.16E-07
Noncancer Dermal Intake - RME = 3.25E-07

Cancer Dermal Intake - CTE = 2.99E-09
Noncancer Dermal Intake - CTE = 2.32E-08

TABLE 7.9 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	7.5E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.5E-03
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.4E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	7.0E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	4.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.5E-03	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	2.5E-03
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	4.6E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	1.2E-03
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	9.6E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.2E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.2E-06	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	1.2E-03
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	6.2E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.1E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	5.2E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.3E-03
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	4.1E-03	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	1.4E-02
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.4E-04	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	2.0E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	6.2E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.1E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.1E-05	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	1.6E-03
	(total)												**1.0E-01**

TABLE 7.9 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.5E-09	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	5.2E-08	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.0E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.6E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	2.3E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.7E-06	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	5.7E-06
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.1E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.8E-05
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	6.6E-08	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.2E-04
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.9E-09	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	1.1E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.4E-08	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	1.9E-04
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.2E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.0E-06
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	9.5E-06	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	3.2E-05
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.3E-07	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	1.2E-04
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.4E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	6.8E-05
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.5E-08	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	1.4E-04
	(total)												**2.4E-02**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.3E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.9 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.5E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.78E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	6.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.41E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	6.24E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.78E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.7E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	9.07E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	5.0E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.01E-06
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.6E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.13E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.8E-04	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.7E-07	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.4E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	5.13E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.4E-07	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.2E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.9E-05	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.5E-03	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	5.0E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.2E-07	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.9E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.5E-06**

TABLE 8.9 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	2.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.4E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.8E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.3E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.9E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	2.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.4E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.8E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	6.3E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.6E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.3E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	5.1E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.0E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.0E-06	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	3.8E-10	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	2.4E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	3.6E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.0E-09	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	5.1E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	4.3E-08	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	3.4E-06	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.2E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	5.1E-10	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	9.0E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.5E-07**
										Total Risk Across All Exposure Routes/Pathways	**3.2E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 7.9a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	6.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	4.6E-09	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.9E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	3.7E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	3.5E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	1.8E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	6.1E-04	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	6.1E-04
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.2E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	2.9E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	2.4E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	8.0E-04
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	3.1E-07	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	3.1E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.5E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	5.2E-04
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.3E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.3E-04
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.0E-03	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	3.4E-03
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.5E-05	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	5.0E-04
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.6E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	5.2E-04
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.7E-06	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	3.9E-04
	(total)												**2.6E-02**

TABLE 7.9a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.6E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	5.1E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.9E-10	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.7E-09	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	7.4E-06
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	3.3E-08	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	1.6E-03
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	4.0E-07	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	4.0E-07
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	7.7E-11	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.3E-06
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	4.7E-09	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.6E-05
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.0E-10	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	8.2E-06
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.0E-09	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	1.4E-05
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	8.6E-09	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.2E-07
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	6.8E-07	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	2.3E-06
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	2.3E-08	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	8.3E-06
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.0E-10	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	4.9E-06
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.8E-09	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	9.9E-06
	(total)												**1.7E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**2.7E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.9a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.9E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.30E-09
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.4E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.97E-08
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.7E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.62E-09
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.9E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.30E-09
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.4E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	8.16E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.5E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	9.06E-08
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.4E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.82E-08
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	7.9E-05	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.5E-08	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.1E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	4.62E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.0E-08	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.0E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.7E-06	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.3E-04	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.5E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.0E-08	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.5E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.3E-07**

TABLE 8.9a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.1E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.7E-10
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.7E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.4E-09
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	6.6E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.8E-10
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.1E-11	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.7E-10
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	4.8E-10	mg/kg-day	3.40E-01	(mg/kg-day)-1	1.6E-10
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.2E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	8.4E-09
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.3E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.6E-09
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.2E-08	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	9.9E-12	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	6.1E-10	mg/kg-day	1.50E+00	(mg/kg-day)-1	9.1E-10
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.6E-11	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.3E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.1E-09	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	8.8E-08	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.0E-09	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.3E-11	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.3E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.7E-08**
										Total Risk Across All Exposure Routes/Pathways	**2.4E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

SITE 3 - TABLE 4.10

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	480	EPA 1993a	240	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	365	EPA 1989a	365	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	EPA 2001	0.1	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	EPA 2001	3,300	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	365	EPA 1989a	365	EPA 1989a	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.83E-08
Noncancer Ingestion Intake - RME = 3.38E-06

Cancer Ingestion Intake - CTE = 2.42E-08
Noncancer Ingestion Intake - CTE = 1.69E-06

Cancer Dermal Intake - RME = 9.96E-08
Noncancer Dermal Intake - RME = 6.97E-06

Cancer Dermal Intake - CTE = 3.32E-08
Noncancer Dermal Intake - CTE = 2.32E-06

TABLE 7.10 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.4E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	5.7E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	4.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.8E-05	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	3.6E-02
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	3.4E-05	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	1.7E+00
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.1E-05	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.9E-02	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	5.9E-02
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.1E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	2.8E-02
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	2.3E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	7.7E-02
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	3.0E-05	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	3.0E-02
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.5E-04	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.9E-02
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.3E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.1E-02
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	9.9E-02	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	3.3E-01
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.4E-03	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	4.8E-02
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.5E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	5.0E-02
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.6E-04	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	3.7E-02
	(total)												**2.5E+00**

TABLE 7.10 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.1E-06	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	2.2E-03
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	9.8E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	4.9E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	3.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	1.2E-04	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	1.2E-04
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	2.3E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.8E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.4E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	4.7E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	6.1E-08	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	2.5E-03
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	3.1E-07	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	4.1E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	2.6E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	6.5E-05
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	2.0E-04	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	6.8E-04
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	7.0E-06	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	2.5E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	3.1E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	1.5E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	5.4E-07	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	3.0E-03
	(total)												**5.1E-01**
												Total Hazard Index Across All Exposure Routes/Pathways	**3.0E+00**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.10 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.58E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.8E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.23E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.2E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	6.00E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.58E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.6E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	8.71E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.8E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	9.66E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.5E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.00E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.4E-04	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.6E-07	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.3E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	4.93E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.3E-07	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.1E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.8E-05	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.4E-03	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.8E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.1E-07	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.7E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.4E-06**

TABLE 8.10 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.7E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.2E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.1E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.2E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.6E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.7E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.2E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.6E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	5.4E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.4E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.8E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	4.3E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	8.7E-08
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	1.7E-06	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	3.3E-10	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	2.0E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	3.0E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	8.8E-10	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	4.4E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	3.7E-08	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	2.9E-06	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.0E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	4.4E-10	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	7.7E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.6E-07**
										Total Risk Across All Exposure Routes/Pathways	**3.0E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 7.10a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	2.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.9E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	2.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	9.0E-06	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.8E-02
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.7E-05	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	8.5E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	5.3E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.9E-02	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	2.9E-02
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	5.6E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	1.4E-02
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.1E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.8E-02
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.5E-05	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	1.5E-02
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	7.4E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.5E-02
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	6.3E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.6E-02
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	5.0E-02	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	1.7E-01
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.7E-03	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	2.4E-02
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	7.4E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.5E-02
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.3E-04	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	1.9E-02
	(total)												**1.2E+00**

TABLE 7.10a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	5.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.7E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	7.4E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	3.3E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	1.6E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	4.0E-05	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	4.0E-05
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	7.7E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.3E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	4.7E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.6E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.0E-08	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	8.2E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.0E-07	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	1.4E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	8.6E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.2E-05
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	6.8E-05	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	2.3E-04
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	2.3E-06	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	8.3E-04
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.0E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	4.9E-04
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.8E-07	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	9.9E-04
	(total)												**1.7E-01**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.4E+00**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.10a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.1E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.29E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.9E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.12E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	4.1E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.00E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.29E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.3E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	4.35E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	2.4E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.83E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	7.5E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.50E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	4.2E-04	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	8.0E-08	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.6E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	2.46E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.1E-07	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.1E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	8.9E-06	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	7.1E-04	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	2.4E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.1E-07	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.9E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.2E-06**

TABLE 8.10a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.6E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.1E-09
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.8E-08
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.3E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.4E-09
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.6E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.1E-09
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	5.3E-09	mg/kg-day	3.40E-01	(mg/kg-day)-1	1.8E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.6E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	9.3E-08
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.4E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.9E-08
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.8E-07	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.1E-10	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	6.8E-09	mg/kg-day	1.50E+00	(mg/kg-day)-1	1.0E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.9E-10	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.5E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.2E-08	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	9.7E-07	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.3E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.5E-10	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.6E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										1.9E-07
										Total Risk Across All Exposure Routes/Pathways	1.4E-06

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

SITE 3 - TABLE 4.11

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	30	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	10,950	EPA 1989a	3,285	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.08	EPA 2001	0.01	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	9,000	EPA 1997a	9,000	EPA 1997a	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	ED	Exposure Duration	(years)	30	EPA 1993a	9	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	10,950	EPA 1989a	3,285	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 2.68E-08
Noncancer Ingestion Intake - RME = 6.26E-08

Cancer Ingestion Intake - CTE = 2.01E-09
Noncancer Ingestion Intake - CTE = 1.57E-08

Cancer Dermal Intake - RME = 1.93E-07
Noncancer Dermal Intake - RME = 4.51E-07

Cancer Dermal Intake - CTE = 3.62E-09
Noncancer Dermal Intake - CTE = 2.82E-08

TABLE 7.11 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	8.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	7.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	8.1E-09	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.3E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	6.6E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	6.3E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	3.1E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	1.1E-03	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	1.1E-03
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	2.1E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	5.2E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	4.3E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.4E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	5.5E-07	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	5.5E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.7E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	9.2E-04
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	2.3E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.8E-04
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.8E-03	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	6.1E-03
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	6.3E-05	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	8.9E-04
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.8E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	9.2E-04
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	4.9E-06	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	6.9E-04
	(total)												**4.6E-02**

TABLE 7.11 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	7.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	7.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a.h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	7.6E-09	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	7.2E-08	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.4E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	6.3E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	3.2E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	2.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	7.8E-06	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	7.8E-06
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.5E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.5E-05
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	9.2E-08	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.1E-04
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.0E-09	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	1.6E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.0E-08	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	2.6E-04
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.7E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.2E-06
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.3E-05	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	4.4E-05
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.5E-07	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	1.6E-04
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.0E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	9.5E-05
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.5E-08	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	1.9E-04
	(total)												**3.3E-02**
												Total Hazard Index Across All Exposure Routes/Pathways	**7.9E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.11 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.5E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.55E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.35E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	4.6E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.33E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.55E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.4E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	4.84E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	2.7E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	5.37E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	8.3E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.67E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	4.7E-04	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	8.9E-08	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.8E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	2.74E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.4E-07	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.2E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	9.9E-06	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	7.9E-04	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	2.7E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.2E-07	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.1E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.3E-06**

TABLE 8.11 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.4E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.2E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	4.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.1E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.4E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.1E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	1.0E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	2.7E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	5.4E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	8.4E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.7E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	3.4E-06	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	6.4E-10	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.9E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	5.9E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.7E-09	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	8.5E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	7.1E-08	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	5.7E-06	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.9E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	8.5E-10	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.5E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										1.1E-06
										Total Risk Across All Exposure Routes/Pathways	**2.4E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 7.11a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	2.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	2.0E-09	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	8.3E-08	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.7E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.6E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	7.8E-03
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	4.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.7E-04	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	2.7E-04
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	5.2E-08	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	1.3E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.1E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.5E-04
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.4E-07	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	1.4E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	6.9E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.3E-04
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	5.8E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.4E-04
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	4.6E-04	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	1.5E-03
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.6E-05	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	2.2E-04
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	6.9E-08	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.3E-04
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.2E-06	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	1.7E-04
	(total)												**1.1E-02**

TABLE 7.11a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.8E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.4E-09	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	6.2E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	4.8E-10	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	4.5E-09	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	9.0E-06
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	3.9E-08	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	2.0E-03
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	4.9E-07	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	4.9E-07
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	9.3E-11	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.5E-06
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	5.7E-09	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.9E-05
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.5E-10	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	9.9E-06
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.2E-09	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	1.6E-05
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.0E-08	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.6E-07
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	8.3E-07	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	2.8E-06
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	2.8E-08	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	1.0E-05
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.2E-10	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	5.9E-06
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.2E-09	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	1.2E-05
	(total)												**2.1E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.3E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.11a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	2.6E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.91E-09
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.4E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.76E-08
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.4E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.50E-09
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	2.6E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.91E-09
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.1E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	3.63E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	2.0E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.03E-08
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	6.3E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.25E-08
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	3.5E-05	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	6.6E-09	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.4E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	2.05E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.8E-08	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	8.8E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	7.4E-07	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	5.9E-05	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	2.0E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	8.9E-09	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.6E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.0E-07**

TABLE 8.11a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.1E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.5E-10
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.7E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.1E-09
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.0E-10	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.8E-10
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.1E-11	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.5E-10
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	5.8E-10	mg/kg-day	3.40E-01	(mg/kg-day)-1	2.0E-10
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	5.1E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.0E-08
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.6E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.2E-09
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	6.3E-08	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.2E-11	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	7.4E-10	mg/kg-day	1.50E+00	(mg/kg-day)-1	1.1E-09
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	3.2E-11	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.6E-10	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.3E-09	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.1E-07	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.6E-09	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.6E-11	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.8E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.0E-08**
										Total Risk Across All Exposure Routes/Pathways	**1.2E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

SITE 3 - TABLE 4.12

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	43	EPA 1997a	43	EPA 1997a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	EPA 1989a	3,650	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	EPA 2001	0.04	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,263	EPA 1997a	3,263	EPA 1997a	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	43	EPA 1997a	43	EPA 1997a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	EPA 1989a	3,650	EPA 1989a	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.73E-08
Noncancer Ingestion Intake - RME = 3.31E-07

Cancer Ingestion Intake - CTE = 1.18E-08
Noncancer Ingestion Intake - CTE = 8.28E-08

Cancer Dermal Intake - RME = 4.63E-07
Noncancer Dermal Intake - RME = 3.24E-06

Cancer Dermal Intake - CTE = 3.09E-08
Noncancer Dermal Intake - CTE = 2.16E-07

TABLE 7.12 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	4.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	5.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	4.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	1.8E-06	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	3.5E-03
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	3.3E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	1.7E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.8E-03	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	5.8E-03
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.1E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	2.7E-03
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	2.3E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	7.5E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.9E-06	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	2.9E-03
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.5E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.8E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.2E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.1E-03
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	9.7E-03	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	3.2E-02
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.3E-04	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	4.7E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.5E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	4.9E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.6E-05	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	3.7E-03
	(total)												**2.4E-01**

TABLE 7.12 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	5.2E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.0E-03
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.5E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	2.3E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.4E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.6E-05	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	5.6E-05
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.1E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.8E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	6.6E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.2E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.9E-08	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	1.1E-03
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.4E-07	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	1.9E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.2E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.0E-05
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	9.5E-05	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	3.2E-04
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.2E-06	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	1.2E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.4E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	6.8E-04
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.5E-07	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	1.4E-03
	(total)												**2.4E-01**
												Total Hazard Index Across All Exposure Routes/Pathways	**4.8E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.12 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.2E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.49E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.7E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.15E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.87E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.49E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.5E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	8.53E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.7E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	9.47E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.5E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.94E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.2E-04	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.6E-07	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.2E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	4.83E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.2E-07	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.1E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.8E-05	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.4E-03	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.7E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.1E-07	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.7E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.4E-06**

TABLE 8.12 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	7.8E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.7E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	7.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.3E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.0E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	7.5E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	7.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.7E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	7.4E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	2.5E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	6.5E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.3E-06
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	2.0E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.0E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.1E-06	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.5E-09	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	9.5E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	1.4E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.1E-09	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.0E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.7E-07	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.4E-05	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.6E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.0E-09	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.6E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.6E-06**
										Total Risk Across All Exposure Routes/Pathways	**5.0E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 7.12a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	9.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	4.4E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	8.8E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	8.3E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	4.1E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	2.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	1.4E-03	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	1.4E-03
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	2.7E-07	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	6.8E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	5.6E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.9E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	7.3E-07	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	7.3E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	3.6E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.2E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	3.1E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	7.7E-04
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	2.4E-03	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	8.1E-03
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	8.3E-05	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	1.2E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	3.6E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.2E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	6.4E-06	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	9.2E-04
	(total)												**6.0E-02**

TABLE 7.12a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	3.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	4.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.7E-09	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.4E-08	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	6.9E-05
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	3.0E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	1.5E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	9.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	3.8E-06	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	3.8E-06
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	7.1E-10	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.2E-05
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	4.4E-08	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.5E-04
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.9E-09	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	7.6E-05
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	9.5E-09	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	1.3E-04
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	8.0E-08	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.0E-06
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	6.3E-06	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	2.1E-05
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	2.2E-07	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	7.7E-05
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	9.5E-10	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	4.5E-05
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.7E-08	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	9.2E-05
	(total)												**1.6E-02**
												Total Hazard Index Across All Exposure Routes/Pathways	**7.6E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.12a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.5E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.12E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.04E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.47E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.12E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	6.3E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	2.13E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.2E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.37E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	3.7E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	7.36E-08
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.1E-04	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	3.9E-08	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	8.0E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	1.21E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.0E-07	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	5.2E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	4.4E-06	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	3.5E-04	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.2E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	5.2E-08	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	9.2E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.9E-07**

TABLE 8.12a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.2E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.8E-09
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.5E-08
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	6.8E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.0E-09
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.2E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.8E-09
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	4.9E-09	mg/kg-day	3.40E-01	(mg/kg-day)-1	1.7E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.3E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	8.6E-08
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.3E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.7E-08
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.4E-07	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.0E-10	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	6.3E-09	mg/kg-day	1.50E+00	(mg/kg-day)-1	9.5E-09
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.7E-10	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.4E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.1E-08	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	9.1E-07	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.1E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.4E-10	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.4E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.7E-07**
										Total Risk Across All Exposure Routes/Pathways	**7.7E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

SITE 3 - TABLE 4.13

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	EPA 1993a	50	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	24	EPA 1993a	7	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	EPA 1989a	2,555	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.07	EPA 2001	0.01	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	5,700	EPA 2001	5,700	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	ED	Exposure Duration	(years)	24	EPA 1993a	7	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	70	EPA 1989a	70	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	EPA 1989a	2,555	EPA 1989a	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.70E-07
Noncancer Ingestion Intake - RME = 1.37E-06

Cancer Ingestion Intake - CTE = 4.58E-08
Noncancer Ingestion Intake - CTE = 4.58E-07

Cancer Dermal Intake - RME = 1.87E-06
Noncancer Dermal Intake - RME = 5.47E-06

Cancer Dermal Intake - CTE = 5.22E-08
Noncancer Dermal Intake - CTE = 5.22E-07

TABLE 7.13 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.6E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.3E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	7.3E-06	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.5E-02
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.4E-05	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	6.8E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	4.3E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.4E-02	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	2.4E-02
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	4.5E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	1.1E-02
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	9.3E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.1E-02
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.2E-05	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	1.2E-02
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	6.0E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.0E-02
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	5.1E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.3E-02
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	4.0E-02	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	1.3E-01
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.4E-03	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	2.0E-02
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	6.0E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.0E-02
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.1E-04	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	1.5E-02
	(total)												**1.0E+00**

TABLE 7.13 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	9.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	8.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	9.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	8.7E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.7E-03
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	7.7E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	3.8E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	2.4E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	9.5E-05	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	9.5E-05
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.8E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.0E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.1E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.7E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.8E-08	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	1.9E-03
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.4E-07	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	3.2E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	2.0E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.1E-05
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.6E-04	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	5.3E-04
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	5.5E-06	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	2.0E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.4E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	1.1E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	4.2E-07	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	2.3E-03
	(total)												**4.0E-01**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.4E+00**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.13 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.1E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.46E-07
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.6E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.11E-06
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	8.0E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.83E-07
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.46E-07
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.5E-06	mg/kg-day	3.40E-01	(mg/kg-day)-1	8.46E-07
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.7E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	9.39E-06
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.5E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.92E-06
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.2E-03	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.5E-06	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.2E-06	mg/kg-day	1.50E+00	(mg/kg-day)-1	4.79E-06
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.1E-06	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.1E-05	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.7E-04	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.4E-02	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.7E-04	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.1E-06	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.6E-05	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.4E-05**

TABLE 8.13 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	3.2E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.3E-07
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.9E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.1E-06
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	4.1E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.0E-07
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	3.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.3E-07
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	3.0E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	1.0E-07
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	2.6E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	5.2E-06
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	8.2E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.6E-06
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	3.3E-05	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	6.2E-09	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.8E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	5.7E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.6E-08	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	8.2E-08	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	6.9E-07	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	5.5E-05	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.9E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	8.3E-09	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.5E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.0E-05**
										Total Risk Across All Exposure Routes/Pathways	**3.4E-05**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 7.13a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.4E-06	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	4.9E-03
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.6E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	2.3E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.4E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.0E-03	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	8.0E-03
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.5E-06	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	3.8E-03
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.1E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.0E-02
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.0E-06	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	4.0E-03
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.0E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	6.7E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.7E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.2E-03
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.3E-02	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	4.5E-02
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.6E-04	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	6.5E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.0E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	6.7E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.5E-05	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	5.1E-03
	(total)												**3.3E-01**

TABLE 7.13a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	8.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	8.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	8.8E-09	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	8.3E-08	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.7E-04
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	7.3E-07	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	3.7E-02
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	2.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	9.1E-06	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	9.1E-06
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.7E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.9E-05
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.1E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.5E-04
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.6E-09	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	1.8E-04
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.3E-08	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	3.1E-04
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.9E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.8E-06
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.5E-05	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	5.1E-05
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	5.2E-07	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	1.9E-04
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.3E-09	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	1.1E-04
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	4.0E-08	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	2.2E-04
	(total)												**3.8E-02**
												Total Hazard Index Across All Exposure Routes/Pathways	**3.7E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.13a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	4.35E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.5E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.01E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.8E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.68E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.35E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.4E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	8.25E-08
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.6E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	9.16E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.4E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.85E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.0E-04	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.5E-07	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	3.1E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	4.67E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.0E-07	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.0E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.7E-05	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.3E-03	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.6E-05	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.0E-07	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.5E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.3E-06**

TABLE 8.13a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	8.8E-09	mg/kg-day	7.30E-01	(mg/kg-day)-1	6.4E-09
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	8.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.9E-08
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.2E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	8.4E-09
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	8.8E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.4E-09
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	8.3E-09	mg/kg-day	3.40E-01	(mg/kg-day)-1	2.8E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	7.3E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.5E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	2.3E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.5E-08
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	9.1E-07	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.7E-10	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	1.1E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	1.6E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.6E-10	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.3E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.9E-08	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.5E-06	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	5.2E-08	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.3E-10	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	4.0E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.9E-07**
										Total Risk Across All Exposure Routes/Pathways	**2.6E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

SITE 3 - TABLE 4.14

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	200	EPA 1993a	100	EPA 1993a	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	6	EPA 1993a	2	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	15	EPA 1989a	15	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	EPA 1989a	730	EPA 1989a	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	EPA 1993a	95%UCL	EPA 1993a	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	EPA 2001	0.04	EPA 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	2,800	EPA 2001	2,800	EPA 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	EPA 2001	chemical-specific	EPA 2001	
	EF	Exposure Frequency	(days/year)	350	EPA 1993a	234	EPA 1993a	
	ED	Exposure Duration	(years)	6	EPA 1993a	2	EPA 1993a	
	CF	Conversion Factor	(mg/kg)	1.00E-06	EPA 1989a	1.00E-06	EPA 1989a	
	BW	Body Weight	(kg)	15	EPA 1989a	15	EPA 1989a	
	AT-C	Averaging Time (Cancer)	(days)	25,550	EPA 1989a	25,550	EPA 1989a	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	EPA 1989a	730	EPA 1989a	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 1.10E-06
Noncancer Ingestion Intake - RME = 1.28E-05

Cancer Ingestion Intake - CTE = 1.22E-07
Noncancer Ingestion Intake - CTE = 4.27E-06

Cancer Dermal Intake - RME = 3.07E-06
Noncancer Dermal Intake - RME = 3.58E-05

Cancer Dermal Intake - CTE = 1.37E-07
Noncancer Dermal Intake - CTE = 4.79E-06

TABLE 8.14a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.6E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.16E-07
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.5E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.07E-06
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.1E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.52E-07
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.16E-07
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	6.5E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	2.20E-07
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.2E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.44E-06
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	3.8E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	7.59E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.1E-03	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	4.0E-07	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	8.3E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	1.25E-06
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.1E-06	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	5.4E-06	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	4.5E-05	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	3.6E-03	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.2E-04	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	5.4E-07	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	9.5E-06	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.1E-06**

TABLE 8.14a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	2.3E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.7E-08
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	2.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.6E-07
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	3.0E-08	mg/kg-day	7.30E-01	(mg/kg-day)-1	2.2E-08
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	2.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.7E-08
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.2E-08	mg/kg-day	3.40E-01	(mg/kg-day)-1	7.4E-09
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.9E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.8E-07
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	6.0E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.2E-07
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.4E-06	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	4.5E-10	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	2.8E-08	mg/kg-day	1.50E+00	(mg/kg-day)-1	4.2E-08
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.2E-09	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	6.0E-09	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	5.1E-08	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	4.0E-06	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.4E-07	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	6.0E-10	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	1.1E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**7.6E-07**
										Total Risk Across All Exposure Routes/Pathways	**6.9E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 7.14a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.6E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.3E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	2.3E-05	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	4.5E-02
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.3E-05	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	2.1E+00
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.3E-05	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	7.4E-02	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	7.4E-02
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.4E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	3.5E-02
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	2.9E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	9.7E-02
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	3.8E-05	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	3.8E-02
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.9E-04	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	6.3E-02
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.6E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.0E-02
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.3E-01	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	4.2E-01
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.3E-03	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	6.1E-02
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.9E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	6.3E-02
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.3E-04	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	4.7E-02
	(total)												**3.1E+00**

TABLE 7.14a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	8.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	7.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	8.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	7.6E-07	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.5E-03
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	6.7E-06	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	3.4E-01
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	2.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	8.3E-05	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	8.3E-05
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.6E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.6E-04
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	9.8E-07	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	3.3E-03
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	4.2E-08	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	1.7E-03
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	2.1E-07	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	2.8E-03
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.8E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.4E-05
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.4E-04	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	4.7E-04
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	4.8E-06	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	1.7E-03
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	2.1E-08	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	1.0E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	3.7E-07	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	2.0E-03
	(total)												**3.5E-01**
										Total Hazard Index Across All Exposure Routes/Pathways			**3.5E+00**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 7.14 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.7E-05	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.5E-05	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	2.2E-05	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.7E-06	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	6.8E-05	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.4E-01
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.3E-04	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	6.4E+00
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	4.0E-05	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	2.2E-01	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	2.2E-01
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	4.2E-05	mg/kg-day	4.00E-04	mg/kg-day	NA	NA	1.1E-01
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	8.7E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.9E-01
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	1.1E-04	mg/kg-day	1.00E-03	mg/kg-day	NA	NA	1.1E-01
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	5.6E-04	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.9E-01
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	4.7E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.2E-01
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	3.7E-01	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	1.2E+00
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.3E-02	mg/kg-day	7.00E-02	mg/kg-day	NA	NA	1.8E-01
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	5.6E-05	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	1.9E-01
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	9.9E-04	mg/kg-day	7.00E-03	mg/kg-day	NA	NA	1.4E-01
	(total)												**9.3E+00**

TABLE 7.14 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	6.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	5.6E-06	mg/kg-day		mg/kg-day	NA	NA	
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	7.9E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	6.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	5.7E-06	mg/kg-day	5.00E-04	mg/kg-day	NA	NA	1.1E-02
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	5.0E-05	mg/kg-day	2.00E-05	mg/kg-day	NA	NA	2.5E+00
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.6E-05	mg/kg-day		mg/kg-day	NA	NA	
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	6.2E-04	mg/kg-day	1.00E+00	mg/kg-day	NA	NA	6.2E-04
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.2E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.0E-03
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	7.3E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.4E-02
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	3.2E-07	mg/kg-day	2.50E-05	mg/kg-day	NA	NA	1.3E-02
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.6E-06	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	2.1E-02
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.3E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.3E-04
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	1.0E-03	mg/kg-day	3.00E-01	mg/kg-day	NA	NA	3.5E-03
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.6E-05	mg/kg-day	2.80E-03	mg/kg-day	NA	NA	1.3E-02
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.6E-07	mg/kg-day	2.10E-05	mg/kg-day	NA	NA	7.5E-03
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.8E-06	mg/kg-day	1.82E-04	mg/kg-day	NA	NA	1.5E-02
	(total)												**2.6E+00**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.2E+01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 8.14 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	1.4E-06	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.04E-06
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	1.3E-06	mg/kg-day	7.30E+00	(mg/kg-day)-1	9.60E-06
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	1.9E-06	mg/kg-day	7.30E-01	(mg/kg-day)-1	1.36E-06
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	1.4E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.04E-06
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	5.8E-06	mg/kg-day	3.40E-01	(mg/kg-day)-1	1.97E-06
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	1.1E-05	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.19E-05
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	3.4E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	6.81E-06
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	1.9E-02	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	3.6E-06	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	7.5E-06	mg/kg-day	1.50E+00	(mg/kg-day)-1	1.12E-05
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	9.6E-06	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	4.8E-05	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	4.1E-04	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	3.2E-02	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	1.1E-03	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	4.8E-06	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	8.5E-05	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.5E-05**

TABLE 8.14 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SEDIMENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzo(a)anthracene	1.30E+00	mg/kg	1.30E+00	mg/kg	M	5.2E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	3.8E-07
	Benzo(a)pyrene	1.20E+00	mg/kg	1.20E+00	mg/kg	M	4.8E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.5E-06
	Benzo(b)fluoranthene	1.70E+00	mg/kg	1.70E+00	mg/kg	M	6.8E-07	mg/kg-day	7.30E-01	(mg/kg-day)-1	5.0E-07
	Dibenzo(a,h)anthracene	1.30E-01	mg/kg	1.30E-01	mg/kg	M	5.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.8E-07
	4,4'-DDT	5.30E+00	mg/kg	5.30E+00	mg/kg	M	4.9E-07	mg/kg-day	3.40E-01	(mg/kg-day)-1	1.7E-07
	Aroclor-1254	1.00E+01	mg/kg	1.00E+01	mg/kg	M	4.3E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	8.6E-06
	Aroclor-1260	3.11E+00	mg/kg	3.11E+00	mg/kg	M	1.3E-06	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.7E-06
	Aluminum	1.74E+04	mg/kg	1.74E+04	mg/kg	M	5.3E-05	mg/kg-day		(mg/kg-day)-1	
	Antimony	3.30E+00	mg/kg	3.30E+00	mg/kg	M	1.0E-08	mg/kg-day		(mg/kg-day)-1	
	Arsenic	6.80E+00	mg/kg	6.80E+00	mg/kg	M	6.3E-07	mg/kg-day	1.50E+00	(mg/kg-day)-1	9.4E-07
	Cadmium	8.80E+00	mg/kg	8.80E+00	mg/kg	M	2.7E-08	mg/kg-day		(mg/kg-day)-1	
	Chromium	4.39E+01	mg/kg	4.39E+01	mg/kg	M	1.3E-07	mg/kg-day		(mg/kg-day)-1	
	Copper	3.70E+02	mg/kg	3.70E+02	mg/kg	M	1.1E-06	mg/kg-day		(mg/kg-day)-1	
	Iron	2.93E+04	mg/kg	2.93E+04	mg/kg	M	9.0E-05	mg/kg-day		(mg/kg-day)-1	
	Manganese	1.00E+03	mg/kg	1.00E+03	mg/kg	M	3.1E-06	mg/kg-day		(mg/kg-day)-1	
	Mercury	4.41E+00	mg/kg	4.41E+00	mg/kg	M	1.4E-08	mg/kg-day		(mg/kg-day)-1	
	Vanadium	7.75E+01	mg/kg	7.75E+01	mg/kg	M	2.4E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.7E-05**
										Total Risk Across All Exposure Routes/Pathways	**7.2E-05**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Arsenic - 0.03 PCBs - 0.14
Metals - 0.001 4,4'-DDT - 0.03
PAHs - 0.13

TABLE 9.1. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	2.8E-07		2.4E-07	5.1E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	2.3E-06		2.0E-06	4.2E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	2.7E-07		2.3E-07	4.9E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	5.6E-07		4.8E-07	1.0E-06	Dibenzo(a,h)anthracene					
			Aroclor-1260	3.4E-06		3.2E-06	6.6E-06	Aroclor-1260					
			Antimony					Antimony	Lifespan	2.0E-02		8.9E-04	2.1E-02
			Copper					Copper	NA	1.1E-02		7.1E-05	1.1E-02
			Mercury					Mercury	CNS	1.2E-02		1.2E-03	1.4E-02
			Silver					Silver	Argyria	2.9E-02		4.7E-03	3.4E-02
							Total Risk Across Soil	1.3E-05					Total Hazard Index Across All Media and All Exposure Routes	7.9E-02

Total Risk Across All Media and All Exposure Routes 1.3E-05

Total Lifespan HI = 2.1E-02
Total CNS HI = 1.4E-02
Total Agyria HI= 3.4E-02

TABLE 9.1a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	4.4E-08		7.5E-09	5.1E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	3.6E-07		6.2E-08	4.2E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	4.2E-08		7.2E-09	4.9E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	8.8E-08		1.5E-08	1.0E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	5.4E-07		1.0E-07	6.4E-07	Aroclor-1260					
			Antimony					Antimony	Lifespan	8.9E-03		7.8E-05	8.9E-03
			Copper					Copper	NA	4.7E-03		6.2E-06	4.7E-03
			Mercury					Mercury	CNS	5.4E-03		1.0E-04	5.5E-03
			Silver					Silver	Argyria	1.3E-02		4.2E-04	1.3E-02
						Total Risk Across Soil	1.3E-06					Total Hazard Index Across All Media and All Exposure Routes	3.2E-02

Total Risk Across All Media and All Exposure Routes 1.3E-06

Total Lifespan HI = 8.9E-03
Total CNS HI = 5.5E-03
Total Agyria HI= 1.3E-02

TABLE 9.2. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	4.0E-08		1.2E-08	5.2E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	3.3E-07		9.9E-08	4.3E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.8E-08		1.1E-08	5.0E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	8.1E-08		2.4E-08	1.1E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.9E-07		1.6E-07	6.5E-07	Aroclor-1260					
			Antimony					Antimony	Lifespan	2.9E-03		4.5E-05	3.0E-03
			Copper					Copper	NA	1.5E-03		3.6E-06	1.5E-03
			Mercury					Mercury	CNS	1.8E-03		5.9E-05	1.8E-03
			Silver					Silver	Argyria	4.1E-03		2.4E-04	4.4E-03
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	4.8E-08		1.4E-08	6.2E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	4.4E-07		1.3E-07	5.7E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	6.2E-08		1.9E-08	8.1E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	4.8E-08		1.4E-08	6.2E-08	Dibenzo(a,h)anthracene					
			4,4'-DDT	9.1E-08		6.3E-09	9.7E-08	4,4'-DDT	Liver	1.5E-03		1.0E-04	1.6E-03
			Aroclor-1254	1.0E-06		3.3E-07	1.3E-06	Aroclor-1254	Immune System	7.0E-02		2.3E-02	9.3E-02
			Aroclor-1260	3.1E-07		1.0E-07	4.1E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	2.5E-03		5.7E-06	2.5E-03
			Antimony					Antimony	Lifespan	1.2E-03		1.8E-05	1.2E-03
			Arsenic	5.1E-07		3.6E-08	5.5E-07	Arsenic	Skin, Vascular	3.2E-03		2.2E-04	3.4E-03
			Cadmium					Cadmium	Kidney	1.2E-03		1.1E-04	1.4E-03
			Chromium					Chromium	NOAEL	2.1E-03		1.9E-04	2.3E-03
			Copper					Copper	NA	1.3E-03		3.0E-06	1.3E-03
			Iron					Iron	Liver/Blood/GI Tract	1.4E-02		3.2E-05	1.4E-02
			Manganese					Manganese	CNS	2.0E-03		1.2E-04	2.1E-03
			Mercury					Mercury	CNS	2.1E-03		6.8E-05	2.1E-03
			Vanadium					Vanadium	NOEL	1.6E-03		1.4E-04	1.7E-03

Total Risk Across Soil	1.3E-06
Total Risk Across Sediment	3.2E-06
Total Risk Across All Media and All Exposure Routes	4.5E-06

Total Hazard Index Across All Media and All Exposure Routes	1.4E-01

Total Lifespan HI =	4.1E-03
Total CNS HI =	6.1E-03
Total Blood HI =	1.4E-02
Total Immune System HI =	9.6E-02
Total Skin HI =	3.4E-03
Total Liver HI =	1.5E-02
Total Vascular HI=	3.4E-03
Total GI Tract HI=	1.4E-02
Total Agyria HI=	4.4E-03

TABLE 9.2a. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	3.6E-09		3.1E-10	3.9E-09	Benzo(a)anthracene					
			Benzo(a)pyrene	3.0E-08		2.5E-09	3.2E-08	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.4E-09		3.0E-10	3.7E-09	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	7.3E-09		6.2E-10	7.9E-09	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.4E-08		4.1E-09	4.8E-08	Aroclor-1260					
			Antimony					Antimony	Lifespan	7.3E-04		3.2E-06	7.3E-04
			Copper					Copper	NA	3.8E-04		2.5E-07	3.9E-04
			Mercury					Mercury	CNS	4.5E-04		4.2E-06	4.5E-04
			Silver					Silver	Argyria	1.0E-03		1.7E-05	1.1E-03
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	4.3E-09		3.7E-10	4.7E-09	Benzo(a)anthracene					
			Benzo(a)pyrene	4.0E-08		3.4E-09	4.3E-08	Benzo(a)pyrene					
			Benzo(b)fluoranthene	5.6E-09		4.8E-10	6.1E-09	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	4.3E-09		3.7E-10	4.7E-09	Dibenzo(a,h)anthracene					
			4,4'-DDT	8.2E-09		1.6E-10	8.3E-09	4,4'-DDT	Liver	3.7E-04		7.4E-06	3.8E-04
			Aroclor-1254	9.1E-08		8.4E-09	9.9E-08	Aroclor-1254	Immune System	1.8E-02		1.6E-03	1.9E-02
			Aroclor-1260	2.8E-08		2.6E-09	3.1E-08	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	6.1E-04		4.0E-07	6.1E-04
			Antimony					Antimony	Lifespan	2.9E-04		1.3E-06	2.9E-04
			Arsenic	4.6E-08		9.1E-10	4.7E-08	Arsenic	Skin, Vascular	8.0E-04		1.6E-05	8.1E-04
			Cadmium					Cadmium	Kidney	3.1E-04		8.2E-06	3.2E-04
			Chromium					Chromium	NOAEL	5.2E-04		1.4E-05	5.3E-04
			Copper					Copper	NA	3.3E-04		2.2E-07	3.3E-04
			Iron					Iron	Liver/Blood/GI Tract	3.4E-03		2.3E-06	3.4E-03
			Manganese					Manganese	CNS	5.0E-04		8.3E-06	5.1E-04
			Mercury					Mercury	CNS	5.2E-04		4.9E-06	5.2E-04
			Vanadium					Vanadium	NOEL	3.9E-04		9.9E-06	4.0E-04
						Total Risk Across Soil	9.6E-08					Total Hazard Index Across All Media and All Exposure Routes	3.0E-02
						Total Risk Across Sediment	2.4E-07						

Total Risk Across All Media and All Exposure Routes: 3.4E-07

Total Lifespan HI =	1.0E-03
Total CNS HI =	1.5E-03
Total Blood HI =	3.4E-03
Total Immune System HI =	2.0E-02
Total Skin HI =	8.1E-04
Total Liver HI =	3.8E-03
Total Vascular HI=	8.1E-04
Total GI Tract HI=	3.4E-03
Total Agyria HI=	1.1E-03

TABLE 9.3. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	3.8E-08		1.0E-08	4.8E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	3.2E-07		8.5E-08	4.0E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.7E-08		9.8E-09	4.7E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	7.8E-08		2.1E-08	9.8E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.7E-07		1.4E-07	6.1E-07	Aroclor-1260					
			Antimony					Antimony	Lifespan	7.0E-02		9.6E-04	7.1E-02
			Copper					Copper	NA	3.7E-02		7.6E-05	3.7E-02
			Mercury					Mercury	CNS	4.3E-02		1.3E-03	4.4E-02
			Silver					Silver	Argyria	9.9E-02		5.1E-03	1.0E-01
Sediment	Sediment	Onsite Diitches	Benzo(a)anthracene	4.6E-08		1.2E-08	5.8E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	4.2E-07		1.1E-07	5.4E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	6.0E-08		1.6E-08	7.6E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	4.6E-08		1.2E-08	5.8E-08	Dibenzo(a,h)anthracene					
			4,4'-DDT	8.7E-08		5.4E-09	9.2E-08	4,4'-DDT	Liver	3.6E-02		2.2E-03	3.8E-02
			Aroclor-1254	9.7E-07		2.8E-07	1.2E-06	Aroclor-1254	Immune System	1.7E+00		4.9E-01	2.2E+00
			Aroclor-1260	3.0E-07		8.7E-08	3.9E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	5.9E-02		1.2E-04	5.9E-02
			Antimony					Antimony	Lifespan	2.8E-02		3.8E-04	2.8E-02
			Arsenic	4.9E-07		3.0E-08	5.2E-07	Arsenic	Skin, Vascular	7.7E-02		4.7E-03	8.1E-02
			Cadmium					Cadmium	Kidney	3.0E-02		2.5E-03	3.2E-02
			Chromium					Chromium	NOAEL	4.9E-02		4.1E-03	5.4E-02
			Copper					Copper	NA	3.1E-02		6.5E-05	3.1E-02
			Iron					Iron	Liver/Blood/GI Tract	3.3E-01		6.8E-04	3.3E-01
			Manganese					Manganese	CNS	4.8E-02		2.5E-03	5.1E-02
			Mercury					Mercury	CNS	5.0E-02		1.5E-03	5.1E-02
			Vanadium					Vanadium	NOEL	3.7E-02		3.0E-03	4.0E-02

Total Risk Across Soil	1.2E-06
Total Risk Across Sediment	3.0E-06
Total Risk Across All Media and All Exposure Routes	4.2E-06

Total Hazard Index Across All Media and All Exposure Routes	3.2E+00

Total Lifespan HI =	9.9E-02
Total CNS HI =	1.5E-01
Total Blood HI =	3.3E-01
Total Immune System HI =	2.2E+00
Total Skin HI =	8.1E-02
Total Liver HI =	3.7E-01
Total Vascular HI=	8.1E-02
Total GI Tract HI=	3.3E-01
Total Agyria HI=	1.0E-01

TABLE 9 3a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	1.9E-08		3.4E-09	2.3E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	1.6E-07		2.8E-08	1.9E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.8E-08		3.3E-09	2.2E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	3.9E-08		6.9E-09	4.6E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	2.4E-07		4.6E-08	2.8E-07	Aroclor-1260					
			Antimony					Antimony	Lifespan	3.5E-02		3.2E-04	3.5E-02
			Copper					Copper	NA	1.8E-02		2.5E-05	1.8E-02
			Mercury					Mercury	CNS	2.1E-02		4.2E-04	2.2E-02
			Silver					Silver	Argyria	5.0E-02		1.7E-03	5.1E-02
Sediment	Sediment	Onsite Diitches	Benzo(a)anthracene	2.3E-08		4.1E-09	2.7E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	2.1E-07		3.8E-08	2.5E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.0E-08		5.4E-09	3.5E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	2.3E-08		4.1E-09	2.7E-08	Dibenzo(a,h)anthracene					
			4,4'-DDT	4.4E-08		1.8E-09	4.5E-08	4,4'-DDT	Liver	1.8E-02		7.4E-04	1.9E-02
			Aroclor-1254	4.8E-07		9.3E-08	5.8E-07	Aroclor-1254	Immune System	8.5E-01		1.6E-01	1.0E+00
			Aroclor-1260	1.5E-07		2.9E-08	1.8E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	2.9E-02		4.0E-05	2.9E-02
			Antimony					Antimony	Lifespan	1.4E-02		1.3E-04	1.4E-02
			Arsenic	2.5E-07		1.0E-08	2.6E-07	Arsenic	Skin, Vascular	3.8E-02		1.6E-03	4.0E-02
			Cadmium					Cadmium	Kidney	1.5E-02		8.2E-04	1.6E-02
			Chromium					Chromium	NOAEL	2.5E-02		1.4E-03	2.6E-02
			Copper					Copper	NA	1.6E-02		2.2E-05	1.6E-02
			Iron					Iron	Liver/Blood/GI Tract	1.7E-01		2.3E-04	1.7E-01
			Manganese					Manganese	CNS	2.4E-02		8.3E-04	2.5E-02
			Mercury					Mercury	CNS	2.5E-02		4.9E-04	2.5E-02
			Vanadium					Vanadium	NOEL	1.9E-02		9.9E-04	2.0E-02

Total Risk Across Soil	5.6E-07
Total Risk Across Sediment	1.4E-06
Total Risk Across All Media and All Exposure Routes	2.0E-06

Total Hazard Index Across All Media and All Exposure Routes: 1.5E+00

Total Lifespan HI =	4.9E-02
Total CNS HI =	7.2E-02
Total Blood HI =	1.7E-01
Total Immune System HI =	4.8E-02
Total Skin HI =	4.0E-02
Total Liver HI =	1.8E-01
Total Vascular HI=	4.0E-02
Total GI Tract HI=	1.7E-01
Total Agyria HI=	5.1E-02

TABLE 9.4. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	2.1E-08		2.0E-08	4.1E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	1.8E-07		1.6E-07	3.4E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	2.0E-08		1.9E-08	4.0E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	4.3E-08		4.0E-08	8.3E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	2.6E-07		2.7E-07	5.3E-07	Aroclor-1260					
			Antimony					Antimony	Lifespan	1.3E-03		6.2E-05	1.4E-03
			Copper					Copper	NA	6.8E-04		4.9E-06	6.9E-04
			Mercury					Mercury	CNS	7.9E-04		8.2E-05	8.7E-04
			Silver					Silver	Argyria	1.8E-03		3.3E-04	2.2E-03
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	2.5E-08		2.4E-08	4.9E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	2.4E-07		2.2E-07	4.6E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.3E-08		3.1E-08	6.4E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	2.5E-08		2.4E-08	4.9E-08	Dibenzo(a,h)anthracene					
			4,4'-DDT	4.8E-08		1.0E-08	5.9E-08	4,4'-DDT	Liver	6.6E-04		1.4E-04	8.1E-04
			Aroclor-1254	5.4E-07		5.4E-07	1.1E-06	Aroclor-1254	Immune System	3.1E-02		3.2E-02	6.3E-02
			Aroclor-1260	1.7E-07		1.7E-07	3.4E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	1.1E-03		7.8E-06	1.1E-03
			Antimony					Antimony	Lifespan	5.2E-04		2.5E-05	5.4E-04
			Arsenic	2.7E-07		5.9E-08	3.3E-07	Arsenic	Skin, Vascular	1.4E-03		3.1E-04	1.7E-03
			Cadmium					Cadmium	Kidney	5.5E-04		1.6E-04	7.1E-04
			Chromium					Chromium	NOAEL	9.2E-04		2.6E-04	1.2E-03
			Copper					Copper	NA	5.8E-04		4.2E-06	5.8E-04
			Iron					Iron	Liver/Blood/GI Tract	6.1E-03		4.4E-05	6.2E-03
			Manganese					Manganese	CNS	8.9E-04		1.6E-04	1.1E-03
			Mercury					Mercury	CNS	9.2E-04		9.5E-05	1.0E-03
			Vanadium					Vanadium	NOEL	6.9E-04		1.9E-04	8.9E-04

Total Risk Across Soil	1.0E-06	Total Hazard Index Across All Media and All Exposure Routes	8.4E-02
Total Risk Across Sediment	2.4E-06		
Total Risk Across All Media and All Exposure Routes	3.5E-06		

Total Lifespan HI =	1.9E-03
Total CNS HI =	2.9E-03
Total Blood HI =	6.2E-03
Total Immune System HI =	6.4E-02
Total Skin HI =	1.7E-03
Total Liver HI =	7.0E-03
Total Vascular HI=	1.7E-03
Total GI Tract HI=	6.2E-03
Total Agyria HI=	2.2E-03

TABLE 9.4a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	1.6E-09		3.7E-10	2.0E-09	Benzo(a)anthracene					
			Benzo(a)pyrene	1.3E-08		3.1E-09	1.6E-08	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.5E-09		3.6E-10	1.9E-09	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	3.2E-09		7.6E-10	4.0E-09	Dibenzo(a,h)anthracene					
			Aroclor-1260	2.0E-08		5.0E-09	2.5E-08	Aroclor-1260					
			Antimony					Antimony	Lifespan	3.2E-04		3.9E-06	3.3E-04
			Copper					Copper	NA	1.7E-04		3.1E-07	1.7E-04
			Mercury					Mercury	CNS	2.0E-04		5.1E-06	2.0E-04
			Silver					Silver	Argyria	4.6E-04		2.1E-05	4.8E-04
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	1.9E-09		4.5E-10	2.4E-09	Benzo(a)anthracene					
			Benzo(a)pyrene	1.8E-08		4.1E-09	2.2E-08	Benzo(a)pyrene					
			Benzo(b)fluoranthene	2.5E-09		5.8E-10	3.1E-09	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.9E-09		4.5E-10	2.4E-09	Dibenzo(a,h)anthracene					
			4,4'-DDT	3.6E-09		2.0E-10	3.8E-09	4,4'-DDT	Liver	1.7E-04		9.0E-06	1.7E-04
			Aroclor-1254	4.0E-08		1.0E-08	5.0E-08	Aroclor-1254	Immune System	7.8E-03		2.0E-03	9.8E-03
			Aroclor-1260	1.3E-08		3.2E-09	1.6E-08	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	2.7E-04		4.9E-07	2.7E-04
			Antimony					Antimony	Lifespan	1.3E-04		1.5E-06	1.3E-04
			Arsenic	2.1E-08		1.1E-09	2.2E-08	Arsenic	Skin, Vascular	3.5E-04		1.9E-05	3.7E-04
			Cadmium					Cadmium	Kidney	1.4E-04		9.9E-06	1.5E-04
			Chromium					Chromium	NOAEL	2.3E-04		1.6E-05	2.5E-04
			Copper					Copper	NA	1.4E-04		2.6E-07	1.5E-04
			Iron					Iron	Liver/Blood/GI Tract	1.5E-03		2.8E-06	1.5E-03
			Manganese					Manganese	CNS	2.2E-04		1.0E-05	2.3E-04
			Mercury					Mercury	CNS	2.3E-04		5.9E-06	2.4E-04
			Vanadium					Vanadium	NOEL	1.7E-04		1.2E-05	1.9E-04

Total Risk Across Soil	4.9E-08
Total Risk Across Sediment	1.2E-07
Total Risk Across All Media and All Exposure Routes	1.7E-07

Total Hazard Index Across All Media and All Exposure Routes	1.5E-02

Total Lifespan HI =	4.6E-04
Total CNS HI =	6.7E-04
Total Blood HI =	1.5E-03
Total Immune System HI =	1.0E-02
Total Skin HI =	3.7E-04
Total Liver HI =	1.7E-03
Total Vascular HI=	3.7E-04
Total GI Tract HI=	1.5E-03
Total Agyria HI=	4.8E-04

TABLE 9.5. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	3.7E-08		4.8E-08	8.5E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	3.1E-07		3.9E-07	7.0E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.6E-08		4.6E-08	8.2E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	7.6E-08		9.7E-08	1.7E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.6E-07		6.4E-07	1.1E-06	Aroclor-1260					
			Antimony					Antimony	Lifespan	6.8E-03		4.5E-04	7.3E-03
			Copper					Copper	NA	3.6E-03		3.5E-05	3.7E-03
			Mercury					Mercury	CNS	4.2E-03		5.9E-04	4.8E-03
			Silver					Silver	Argyria	9.7E-03		2.4E-03	1.2E-02
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	4.5E-08		5.7E-08	1.0E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	4.1E-07		5.3E-07	9.4E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	5.9E-08		7.5E-08	1.3E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	4.5E-08		5.7E-08	1.0E-07	Dibenzo(a,h)anthracene					
			4,4'-DDT	8.5E-08		2.5E-08	1.1E-07	4,4'-DDT	Liver	3.5E-03		1.0E-03	4.5E-03
			Aroclor-1254	9.5E-07		1.3E-06	2.2E-06	Aroclor-1254	Immune System	1.7E-01		2.3E-01	3.9E-01
			Aroclor-1260	2.9E-07		4.0E-07	7.0E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	5.8E-03		5.6E-05	5.8E-03
			Antimony					Antimony	Lifespan	2.7E-03		1.8E-04	2.9E-03
			Arsenic	4.8E-07		1.4E-07	6.2E-07	Arsenic	Skin, Vascular	7.5E-03		2.2E-03	9.7E-03
			Cadmium					Cadmium	Kidney	2.9E-03		1.1E-03	4.1E-03
			Chromium					Chromium	NOAEL	4.8E-03		1.9E-03	6.7E-03
			Copper					Copper	NA	3.1E-03		3.0E-05	3.1E-03
			Iron					Iron	Liver/Blood/GI Tract	3.2E-02		3.2E-04	3.3E-02
			Manganese					Manganese	CNS	4.7E-03		1.2E-03	5.9E-03
			Mercury					Mercury	CNS	4.9E-03		6.8E-04	5.5E-03
			Vanadium					Vanadium	NOEL	3.7E-03		1.4E-03	5.0E-03

Total Risk Across Soil	2.1E-06
Total Risk Across Sediment	5.0E-06
Total Risk Across All Media and All Exposure Routes	7.1E-06

Total Hazard Index Across All Media and All Exposure Routes: 5.1E-01

Total Lifespan HI =	1.0E-02
Total CNS HI =	1.6E-02
Total Blood HI =	3.3E-02
Total Immune System HI =	4.0E-01
Total Skin HI =	9.7E-03
Total Liver HI =	3.7E-02
Total Vascular HI=	9.7E-03
Total GI Tract HI=	3.3E-02
Total Agyria HI=	1.2E-02

TABLE 9.5a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	9.4E-09		3.2E-09	1.3E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	7.7E-08		2.6E-08	1.0E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	9.0E-09		3.1E-09	1.2E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.9E-08		6.4E-09	2.5E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	1.2E-07		4.2E-08	1.6E-07	Aroclor-1260					
			Antimony					Antimony	Lifespan	1.7E-03		3.0E-05	1.7E-03
			Copper					Copper	NA	9.0E-04		2.4E-06	9.1E-04
			Mercury					Mercury	CNS	1.0E-03		3.9E-05	1.1E-03
			Silver					Silver	Argyria	2.4E-03		1.6E-04	2.6E-03
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	1.1E-08		3.8E-09	1.5E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	1.0E-07		3.5E-08	1.4E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.5E-08		5.0E-09	2.0E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.1E-08		3.8E-09	1.5E-08	Dibenzo(a,h)anthracene					
			4,4'-DDT	2.1E-08		1.7E-09	2.3E-08	4,4'-DDT	Liver	8.8E-04		6.9E-05	9.5E-04
			Aroclor-1254	2.4E-07		8.6E-08	3.2E-07	Aroclor-1254	Immune System	4.1E-02		1.5E-02	5.7E-02
			Aroclor-1260	7.4E-08		2.7E-08	1.0E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	1.4E-03		3.8E-06	1.4E-03
			Antimony					Antimony	Lifespan	6.8E-04		1.2E-05	7.0E-04
			Arsenic	1.2E-07		9.5E-09	1.3E-07	Arsenic	Skin, Vascular	1.9E-03		1.5E-04	2.0E-03
			Cadmium					Cadmium	Kidney	7.3E-04		7.6E-05	8.1E-04
			Chromium					Chromium	NOAEL	1.2E-03		1.3E-04	1.3E-03
			Copper					Copper	NA	7.7E-04		2.0E-06	7.7E-04
			Iron					Iron	Liver/Blood/GI Tract	8.1E-03		2.1E-05	8.1E-03
			Manganese					Manganese	CNS	1.2E-03		7.7E-05	1.3E-03
			Mercury					Mercury	CNS	1.2E-03		4.5E-05	1.3E-03
			Vanadium					Vanadium	NOEL	9.2E-04		9.2E-05	1.0E-03

Total Risk Across Soil	3.1E-07
Total Risk Across Sediment	7.7E-07
Total Risk Across All Media and All Exposure Routes	1.1E-06

Total Hazard Index Across All Media and All Exposure Routes	8.3E-02
Total Lifespan HI =	2.4E-03
Total CNS HI =	3.6E-03
Total Blood HI =	8.1E-03
Total Immune System HI =	5.8E-02
Total Skin HI =	2.0E-03
Total Liver HI =	9.1E-03
Total Vascular HI=	2.0E-03
Total GI Tract HI=	8.1E-03
Total Agyria HI=	2.6E-03

TABLE 9.6. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Center Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	3.1E-07		3.4E-07	6.5E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	2.6E-06		2.8E-06	5.3E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.0E-07		3.2E-07	6.2E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	6.3E-07		6.9E-07	1.3E-06	Dibenzo(a,h)anthracene					
			Aroclor-1260	3.8E-06		4.5E-06	8.3E-06	Aroclor-1260					
			Antimony					Antimony	Lifespan	9.4E-02		5.3E-03	1.0E-01
			Copper					Copper	NA	5.0E-02		4.2E-04	5.0E-02
			Mercury					Mercury	CNS	5.8E-02		6.9E-03	6.5E-02
			Silver					Silver	Argyria	1.3E-01		2.8E-02	1.6E-01
						Total Risk Across Soil	1.6E-05					Total Hazard Index Across All Media and All Exposure Routes	3.8E-01

Total Risk Across All Media and All Exposure Routes 1.6E-05

Total Lifespan HI = 1.0E-01
Total CNS HI = 6.5E-02
Total Agyria HI= 1.6E-01

TABLE 9.6a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Center Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	6.8E-08		2.0E-08	8.8E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	5.6E-07		1.6E-07	7.2E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	6.5E-08		1.9E-08	8.4E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.4E-07		4.0E-08	1.8E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	8.4E-07		2.6E-07	1.1E-06	Aroclor-1260					
			Antimony					Antimony	Lifespan	4.1E-02		6.2E-04	4.2E-02
			Copper					Copper	NA	2.2E-02		4.9E-05	2.2E-02
			Mercury					Mercury	CNS	2.5E-02		8.1E-04	2.6E-02
			Silver					Silver	Argyria	5.9E-02		3.3E-03	6.2E-02
						Total Risk Across Soil	2.2E-06					Total Hazard Index Across All Media and All Exposure Routes	1.5E-01

Total Risk Across All Media and All Exposure Routes: 2.2E-06

Total Lifespan HI = 4.2E-02
Total CNS HI = 2.6E-02
Total Agyria HI= 6.2E-02

TABLE 9.7. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	3.7E-07		1.9E-07	5.6E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	3.1E-06		1.6E-06	4.7E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.6E-07		1.9E-07	5.4E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	7.5E-07		3.9E-07	1.1E-06	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.6E-06		2.6E-06	7.2E-06	Aroclor-1260					
			Antimony					Antimony	Lifespan	2.8E-02		7.5E-04	2.9E-02
			Copper					Copper	NA	1.5E-02		6.0E-05	1.5E-02
			Mercury					Mercury	CNS	1.7E-02		9.9E-04	1.8E-02
			Silver					Silver	Argyria	4.0E-02		4.0E-03	4.4E-02
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	4.5E-07		2.3E-07	6.8E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	4.1E-06		2.1E-06	6.2E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	5.8E-07		3.0E-07	8.9E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	4.5E-07		2.3E-07	6.8E-07	Dibenzo(a,h)anthracene					
			4,4'-DDT	8.5E-07		1.0E-07	9.5E-07	4,4'-DDT	Liver	1.5E-02		1.7E-03	1.6E-02
			Aroclor-1254	9.4E-06		5.2E-06	1.5E-05	Aroclor-1254	Immune System	6.8E-01		3.8E-01	1.1E+00
			Aroclor-1260	2.9E-06		1.6E-06	4.6E-06	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	2.4E-02		9.5E-05	2.4E-02
			Antimony					Antimony	Lifespan	1.1E-02		3.0E-04	1.2E-02
			Arsenic	4.8E-06		5.7E-07	5.4E-06	Arsenic	Skin, Vascular	3.1E-02		3.7E-03	3.5E-02
			Cadmium					Cadmium	Kidney	1.2E-02		1.9E-03	1.4E-02
			Chromium					Chromium	NOAEL	2.0E-02		3.2E-03	2.3E-02
			Copper					Copper	NA	1.3E-02		5.1E-05	1.3E-02
			Iron					Iron	Liver/Blood/GI Tract	1.3E-01		5.3E-04	1.3E-01
			Manganese					Manganese	CNS	2.0E-02		2.0E-03	2.2E-02
			Mercury					Mercury	CNS	2.0E-02		1.1E-03	2.1E-02
			Vanadium					Vanadium	NOEL	1.5E-02		2.3E-03	1.7E-02

Total Risk Across Soil: 1.4E-05
Total Risk Across Sediment: 3.4E-05
Total Risk Across All Media and All Exposure Routes: 4.8E-05

Total Hazard Index Across All Media and All Exposure Routes: 1.5E+00

Total Lifespan HI =	4.1E-02
Total CNS HI =	6.1E-02
Total Blood HI =	1.3E-01
Total Immune System HI =	1.1E+00
Total Skin HI =	3.5E-02
Total Liver HI =	1.5E-01
Total Vascular HI=	3.5E-02
Total GI Tract HI=	1.3E-01
Total Agyria HI=	4.4E-02

8.5E-06	2.6E-05	
9.5E-07	3.1E-06	1.1E-04
1.9E-05	5.9E-05	
5.4E-06	1.7E-05	

TABLE 9.7a CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	3.6E-08		5.4E-09	4.2E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	3.0E-07		4.4E-08	3.4E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.5E-08		5.2E-09	4.0E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	7.4E-08		1.1E-08	8.4E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.5E-07		7.2E-08	5.2E-07	Aroclor-1260					
			Antimony					Antimony	Lifespan	9.5E-03		7.2E-05	9.5E-03
			Copper					Copper	NA	5.0E-03		5.7E-06	5.0E-03
			Mercury					Mercury	CNS	5.8E-03		9.4E-05	5.9E-03
			Silver					Silver	Argyria	1.3E-02		3.8E-04	1.4E-02
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	4.3E-08		6.4E-09	5.0E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	4.0E-07		5.9E-08	4.6E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	5.7E-08		8.4E-09	6.5E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	4.3E-08		6.4E-09	5.0E-08	Dibenzo(a,h)anthracene					
			4,4'-DDT	8.3E-08		2.8E-09	8.5E-08	4,4'-DDT	Liver	4.9E-03		1.7E-04	5.0E-03
			Aroclor-1254	9.2E-07		1.5E-07	1.1E-06	Aroclor-1254	Immune System	2.3E-01		3.7E-02	2.7E-01
			Aroclor-1260	2.8E-07		4.5E-08	3.3E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	8.0E-03		9.1E-06	8.0E-03
			Antimony					Antimony	Lifespan	3.8E-03		2.9E-05	3.8E-03
			Arsenic	4.7E-07		1.6E-08	4.8E-07	Arsenic	Skin, Vascular	1.0E-02		3.5E-04	1.1E-02
			Cadmium					Cadmium	Kidney	4.0E-03		1.8E-04	4.2E-03
			Chromium					Chromium	NOAEL	6.7E-03		3.1E-04	7.0E-03
			Copper					Copper	NA	4.2E-03		4.8E-06	4.2E-03
			Iron					Iron	Liver/Blood/GI Tract	4.5E-02		5.1E-05	4.5E-02
			Manganese					Manganese	CNS	6.5E-03		1.9E-04	6.7E-03
			Mercury					Mercury	CNS	6.7E-03		1.1E-04	6.8E-03
			Vanadium					Vanadium	NOEL	5.1E-03		2.2E-04	5.3E-03

Total Risk Across Soil	1.0E-06
Total Risk Across Sediment	2.6E-06
Total Risk Across All Media and All Exposure Routes	3.6E-06

Total Hazard Index Across All Media and All Exposure Routes	4.1E-01
Total Lifespan HI =	1.3E-02
Total CNS HI =	1.9E-02
Total Blood HI =	4.5E-02
Total Immune System HI =	2.7E-01
Total Skin HI =	1.1E-02
Total Liver HI =	5.0E-02
Total Vascular HI=	1.1E-02
Total GI Tract HI=	4.5E-02
Total Agyria HI=	1.4E-02

TABLE 9.8. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	8.7E-07		3.2E-07	1.2E-06	Benzo(a)anthracene					
			Benzo(a)pyrene	7.1E-06		2.6E-06	9.8E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	8.3E-07		3.0E-07	1.1E-06	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.8E-06		6.4E-07	2.4E-06	Dibenzo(a,h)anthracene					
			Aroclor-1260	1.1E-05		4.2E-06	1.5E-05	Aroclor-1260					
			Antimony					Antimony	Lifespan	2.6E-01		4.9E-03	2.7E-01
			Copper					Copper	NA	1.4E-01		3.9E-04	1.4E-01
			Mercury					Mercury	CNS	1.6E-01		6.5E-03	1.7E-01
			Silver					Silver	Argyria	3.8E-01		2.6E-02	4.0E-01
Sediment	Sediment	Onsite Ditches	Benzo(a)anthracene	1.0E-06		3.8E-07	1.4E-06	Benzo(a)anthracene					
			Benzo(a)pyrene	9.6E-06		3.5E-06	1.3E-05	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.4E-06		5.0E-07	1.9E-06	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.0E-06		3.8E-07	1.4E-06	Dibenzo(a,h)anthracene					
			4,4'-DDT	2.0E-06		1.7E-07	2.1E-06	4,4'-DDT	Liver	1.4E-01		1.1E-02	1.5E-01
			Aroclor-1254	2.2E-05		8.6E-06	3.1E-05	Aroclor-1254	Immune System	6.4E+00		2.5E+00	8.9E+00
			Aroclor-1260	6.8E-06		2.7E-06	9.5E-06	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	2.2E-01		6.2E-04	2.2E-01
			Antimony					Antimony	Lifespan	1.1E-01		2.0E-03	1.1E-01
			Arsenic	1.1E-05		9.4E-07	1.2E-05	Arsenic	Skin, Vascular	2.9E-01		2.4E-02	3.1E-01
			Cadmium					Cadmium	Kidney	1.1E-01		1.3E-02	1.3E-01
			Chromium					Chromium	NOAEL	1.9E-01		2.1E-02	2.1E-01
			Copper					Copper	NA	1.2E-01		3.3E-04	1.2E-01
			Iron					Iron	Liver/Blood/GI Tract	1.2E+00		3.5E-03	1.3E+00
			Manganese					Manganese	CNS	1.8E-01		1.3E-02	2.0E-01
			Mercury					Mercury	CNS	1.9E-01		7.5E-03	2.0E-01
			Vanadium					Vanadium	NOEL	1.4E-01		1.5E-02	1.6E-01

Total Risk Across Soil	2.9E-05
Total Risk Across Sediment	7.2E-05
Total Risk Across All Media and All Exposure Routes	1.0E-04

Total Hazard Index Across All Media and All Exposure Routes: 1.3E+01

Total Lifespan HI =	3.8E-01
Total CNS HI =	5.6E-01
Total Blood HI =	1.0E+01
Total Immune System HI =	2.2E-01
Total Skin HI =	3.1E-01
Total Liver HI =	1.4E+00
Total Vascular HI=	3.1E-01
Total GI Tract HI=	1.3E+00
Total Agyria HI=	4.0E-01

1.8E-05
2.1E-06
4.0E-05
1.2E-05

7.2E-05

TABLE 9.8a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT
SITE 3 - PISTOL RANGE LANDFILL
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface/ Subsurface Soil	Benzo(a)anthracene	9.7E-08		1.4E-08	1.1E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	8.0E-07		1.2E-07	9.1E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	9.3E-08		1.4E-08	1.1E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	2.0E-07		2.9E-08	2.2E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	1.2E-06		1.9E-07	1.4E-06	Aroclor-1260					
			Antimony					Antimony	Lifespan	8.8E-02		6.6E-04	8.9E-02
			Copper					Copper	NA	4.7E-02		5.2E-05	4.7E-02
			Mercury					Mercury	CNS	5.4E-02		8.7E-04	5.5E-02
			Silver					Silver	Argyria	1.3E-01		3.5E-03	1.3E-01
Sediment	Sediment	Onsite Diitches	Benzo(a)anthracene	1.2E-07		1.7E-08	1.3E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	1.1E-06		1.6E-07	1.2E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.5E-07		2.2E-08	1.7E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.2E-07		1.7E-08	1.3E-07	Dibenzo(a,h)anthracene					
			4,4'-DDT	2.2E-07		7.4E-09	2.3E-07	4,4'-DDT	Liver	4.5E-02		1.5E-03	4.7E-02
			Aroclor-1254	2.4E-06		3.8E-07	2.8E-06	Aroclor-1254	Immune System	2.1E+00		3.4E-01	2.5E+00
			Aroclor-1260	7.6E-07		1.2E-07	8.8E-07	Aroclor-1260					
			Aluminum					Aluminum	Immunological, Nails	7.4E-02		8.3E-05	7.4E-02
			Antimony					Antimony	Lifespan	3.5E-02		2.6E-04	3.6E-02
			Arsenic	1.2E-06		4.2E-08	1.3E-06	Arsenic	Skin, Vascular	9.7E-02		3.3E-03	1.0E-01
			Cadmium					Cadmium	Kidney	3.8E-02		1.7E-03	3.9E-02
			Chromium					Chromium	NOAEL	6.3E-02		2.8E-03	6.5E-02
			Copper					Copper	NA	4.0E-02		4.4E-05	4.0E-02
			Iron					Iron	Liver/Blood/GI Tract	4.2E-01		4.7E-04	4.2E-01
			Manganese					Manganese	CNS	6.1E-02		1.7E-03	6.3E-02
			Mercury					Mercury	CNS	6.3E-02		1.0E-03	6.4E-02
			Vanadium					Vanadium	NOEL	4.7E-02		2.0E-03	4.9E-02
						Total Risk Across Soil	2.7E-06					Total Hazard Index Across All Media and All Exposure Routes	3.8E+00
						Total Risk Across Sediment	6.9E-06						
						Total Risk Across All Media and All Exposure Routes	9.6E-06						

Total Lifespan HI =	1.2E-01
Total CNS HI =	1.8E-01
Total Blood HI =	4.2E-01
Total Immune System HI =	2.5E+00
Total Skin HI =	1.0E-01
Total Liver HI =	4.6E-01
Total Vascular HI=	1.0E-01
Total GI Tract HI=	4.2E-01
Total Agyria HI=	1.3E-01